NEW-YORK FARMER,

AND

AMERICAN GARDENER'S MAGAZINE.

VOL. IX.] PUBLISHED MONTHLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT THREE DOLLARS A-YEAR, IN ADVANCE. [No. 5.

D. K. MINOR, PROPRIETOR.] FOR MAY, 1836. [NEW SERIES—VOL. IV.

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STATE HISTORICAL SOCIETY
816 STATE STREET
MADISON, WISCONSIN 53706

☞ I must again remind those who have *not* yet remitted the amount due for the Farmer for *previous years*, and for the *current year*, that I am much in want of it. I wish to publish, on the cover of the next, or June number, a continuation of the list of payments, and it will afford me great pleasure, as well as convenience, to have it contain every name on the book which did not appear in the previous list of payments. Circulars will be sent to those indebted, after the appearance of next number.

The next number of the Farmer will be issued about the middle of June. The friends of the work, who are willing to aid the cause, by contributing to its columns, are desired to send in their contributions as early as possible,—not later, certainly, than the *10th June*, for the June number, and after that by the *25th of June*, and each succeeding month.

CHAPTALS' CHEMISTRY.—We have frequently been inquired of for *Chaptals' Chemistry*. It can be had of Messrs. Leavitt, Lord & Co., 180 Broadway. Price one dollar.

CASHMERE GOATS.—We were invited, a few days since, by Mr. J. DONALDSON KINNEAR, of Albany, to view a Cashmere Goat. Mr. Kinnear, through the aid of relatives in France, purchased a pair of these beautiful and rare animals, from a gentleman who owns the only flock in France; and they were brought from Paris to Havre in the Diligence, and there put on board of one of the packets, but from some cause, the voyage was too much for the buck, which died, as well as the young kid, which was added to the family on the voyage. The doe, however, survived; and although very lean, is a beautiful animal; being, as we were informed, the *first ever imported into this country*, will, we hope, be the first of *numerous flocks* which shall in a few years cover our hills; and we trust that Mr. Kinnear may soon replace his loss, and be successful in rearing a flock which may be profitable. Why may we not, in a few years, manufacture Cashmere shawls, as well as silk? We MAY—and shall do it—and compete with the foreign manufacture in this, as in every thing else we undertake.

☞ *This number of the New-York Farmer consists of two sheets—the postage therefore is three cents for any distance under, and five for any distance over, one hundred miles.*

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For the New-York Farmer.

Mr. Editor.—Having been for about thirty years, the most extensive breeder in the State of New-York, of the improved Short Horned English Cattle, an occupation from which I have now retired, and having recently viewed an extraordinary fine cow, with a bull calf, imported by *Mr. Lewis Beach* of this city, as also an uncommon fine bull, all of the improved short horned kind imported by Mr. A. Bell, and purchased by Mr. Beach, with the intention of sending the same to his estate near the town of Lebanon, in the county of Warren in the State of Ohio, for the purpose of there improving the breed of Cattle, and as some gentlemen from Kentucky have visited England the past summer, to make purchases with the like view, my attention has been called to this important object, permit me, therefore, to offer the following.

THOUGHTS, ON THE SELECTION, BREEDING, AND FATTENING FOR MARKET, OF NEAT OR HORNED CATTLE.

It will, doubtlessly, be admitted that the husbandmen of America are behind those of some parts of Europe, England, our mother country, in particular, in scientific as well as practical agriculture, especially that branch which appertains to selecting, breeding, and rearing domestic animals; the improved breeds of both horses, or neat or horned cattle, in the Island of Great Britain, surpassing, at this day, those of any other country in Europe.

Fortunately for us, some spirited agriculturists have, of late years, introduced to the State of New-York, as also other sections of the Union, the most approved breeds of English cattle; but the points which constitute their superiorqualifications and gives them an additional and intrinsic value, are at this day but partially understood; nor do our husbandmen or breeders, with few exceptions, appear to have that knowledge of the subject and discriminating judgment, requisite for the selection of individuals, or making choice of the breeds that will repay them best, for their care, and give the largest return for the capital employed, or for the quantity of provender expended in their support, and bringing them to maturity, whether in the light of breeding and rearing in the first stage, or fattening for market in the second.

I have, with peculiar interest, some years past, attended the meetings of the Massachusetts Berkshire, and Brighton Agricultural Fairs, held by the Societies, for the express purpose of inspecting their cattle, and have viewed the stock in many districts of that and other States. Although much credit is due to the gentlemen and breeders of Massachusetts, as also to many in other States, who have displayed great zeal and persevering industry, and in addition expended much money, in the importation of English breeds, favorites of the present day, yet by far the greater part of our farmers have fallen into the prevalent error, of adhering and sacrificing every thing to *size*, too often emanating from large bones, and disproportioned, corpulent masses, tending to constitute a huge coarse animal, their pride and aim being directed, as it were, to the production of a beast of large dimensions, that will fatten to an extraordinary weight, no matter what the cost, to the exclusion of those valuable qualifications, which constitute *profitable stock*, such as I shall hereafter endeavor to describe.

Strange as it may appear, it is questionable if even drovers, who are in the constant practice of purchasing fat cattle for the butchers, or for a distant market, are proper judges of the kind of stock to which I allude. Their discernment is directed to an object very different from that of the consideration of the profit and loss account of the breeder or feeder; it wholly consists in estimating from a view of the animal when alive, what it will weigh when arrived at market and there slaughtered, and asertaining from the handling of certain points, whether the subject is sufficiently fat for the shambles, and to what degree of perfection this fattening process has been carried. It is no part of their business to calculate what it has cost the breeder to rear an ox of a particular size or kind, or the feeder to make him fat. They care not whether the feeder has incurred a loss or realized a profit; it is sufficient for their purpose, that the animal *is* fat, and from habit, and almost daily practice, their judgment in this particular and in estimating weight, becomes mechanical and unerring.

If these drovers presume to offer an opinion as to the selection of the most profitable stock to breed from, or to feed, it is calculated to advance their own interest and that of their constant customers, the butchers, whom it behooves them to please, but by no means, that of breeder or feeder, especially should the latter agree to take a given price by weight when slaughtered, for chance to venture forth to a city market.

I have said, and I repeat it, with a view of impressing what I here advance, on the minds of husbandmen, that the interest of the drovers is amalgamated with that of the butchers, for whom the former buy, but differs widely from that of the farmer or feeder, as to the profits to be derived from cattle when bought and sold by the weight, after being slaughtered, a circumstance very imperfectly understood by farmers, which I shall explain.

In buying and selling by weight, there are two modes practised, as to weighing; the one, that of *sinking the offal*, as it is termed, that is, weighing only *the four quarters, or carcase, when dressed*, without taking into account the weight of the *hide and tallow*.

The other mode is termed *weighing all round*, that is, estimating in the aggregate the weight of *beef, hide and tallow*.

The former mode (of sinking the offal,) is pursued in the city of New-York, and some other large cities; the latter method is practised in country towns, and in the country generally.

The hide and tallow are equal in weight to 20 per cent., or one-fifth, of the whole weight of the animal after being slaughtered and dressed, when well fattened, but if very fat, somewhat more, and is sometimes absurdly called the *fifth quarter*.

It is to be observed, that the New-York butcher pays only for the weight of the *four quarters*; that is, the *beef, or carcase, when dressed*, and *pockets* th hide and tallow as clear profit of 20 per cent., even should he retail out the beef on his stall for the same sum that he paid, but he always has a further profit on *it*. Consequently, *the lighter the beef weighs*, for which *he has to pay*, and *the heavier th etallow and hide*, for which *he* pays nothing, the *greater his profits*, and *the less* those of the feeder.

It is an established fact, well understood by medical men, as also by experienced and scientific feeders, that there is a certain pitch, beyond which the process of fattening cannot be carried, inasmuch as that the system or constitution of the animal, or organs of life, will admit of only a given quantity of fat or suet, whether deposited in the intestines, or mixed throughout the meat; consequently, the more the beef or flesh is interlarded with fat, the less remains to be attached to the intestines, or to add to the weight of what is termed the caul; and vice versa.

It is beyond dispute, that those cattle whose flesh is intermixed, marble-like, with fat throughout, weigh heaviest when dressed, in proportion to the dimensions of the carcase, the beef, owing to that circumstance, being full of nutritious matter; on the other hand, those whose flesh is void of this beautiful red and white, variegated mixture of fat and lean, whose meat cuts up red, and sometimes what is worse, of a dark color, resembling horse-flesh, technically called lyrey, weigh lighter in the cacrase, or quarters, when dressed, although they may have a larger proportionate weight of caul or gut fat, or rough tallow, in consequence of the fat being more externally and abstractedly lodged in the intestines.

We will suppose that two oxen, when put up to fatten, weighed eight hundred pounds each, beef, hide, and tallow included; the one, of that breed which was disposed to mix or marble the flesh throughout with fat—the other, one of those whose flesh did not become thus variegated, but continued, as before, red, being merely coated on the out and inside with a portion of fat. These two beasts shall be stall fed for six months, each having daily the same allowance of food in quantity, kind, and quality, and in all respects be treated with the same attention. At the expiration of the six months, they are sold to a New-York butcher at, say $10 per cwt., slaughtered and weighed. Which do you suppose, reader, will give the greatest return to the feeder, for the given quantity of provender which each has consumed? The former, unquestionably—he will weigh much heavier in the beef, that is, the four quarters when dressed, he will have a less ratio of gut fat or rough tallow, and his hide will be thinner, and consequently lighter, than his competitor, he will probably have arrived at the gross weight of 1,300 lbs.—of which aggregate, his beef, when dressed, will weigh 1000 lbs., rough tallow or gut fat 200 lbs., hide 100 lbs. The other bullock, we will venture to say, will not in toto come up to 1,200 lbs., in the following proportions: beef, when dressed, about 850 lbs., rough tallow 200 lbs., hide 110 lbs., making a total of 1,160 lbs. Now the city butcher, who pays only for the beef, gets, as it were, a clear profit of 200 lbs. of tallow, and 100 of hide, upon his payment in the one case of $100—whereas, in the other, he obtains the like quantity of tallow with 20lbs. more of hide, for only $85. It is true, he gets in the first case 100 lbs. the most beef, but this is by no means equal to $15 dollars—the difference in the cost of the two animals, equal to 15 per cent., which, at the same time, is the precise difference to the feeder, in fattening the one or the other of these distinct breeds. But suppose the feeder, in place of selling to a city butcher, is situate remote from any large town, and disposes of his cattle for packing or barrelling, where the custom is to weigh "all round," as it is termed, taking into the estimate the gross weight, of beef, hide, and tallow? The same argument here prevails, the aggregate weight of the ox which intermixes the flesh and suet being the greatest. This position may appear to rest upon naked assertion, but it is a theory well known to all cattle feeders of experience, that animals of this last description fatten most quickly, and come to the greatest weight upon a given quantity of food. Let the breeder and feeder of cattle bear in mind, that all live stock are mere machines, made use of by the husbandman to convert provender into money, consequently that which produces the largest sum in return for a given quantity of provender expended, is the best. He, then, is the basis upon which the cattle dealer or farmer is to rest his choice.

There are certain rules to be adhered to in this branch of the agriculturist's pursuits, without a strict observance of which, he will waste his time and employ his capital to little purpose, at all events, will never bring his stock to that excellence so much desired, and so easily to be attained. Numbers are not so much to be sought after, as a well chosen stock proportioned to the means of support; a few, well attended to, will afford a surer, as well as a greater profit, a large number worse fed, and occasionally neglected; for it is a maxim to be strictly observed, that condition gained, ought never to be lost, or even allowed in the least to recede.

In making selection of a breeding stock, there are four qualifications to be minutely attended to; these may be considered the four points of perfection:—1st, beauty of form; 2d, utility of form; 3d, texture or grain of the flesh; 4th, the fattening quality, or propensity to become fat quickly, and at an early age.

By beauty of form is meant that symmetry or due proportion throughout the frame constitutes which strength, agility and facility of movement, which though much to be desired, is not to be sought after to the exclusion or interference with what is termed *utility of form*, which the case and discernment of eminent breeders have constituted, by improving the principal parts, or prime cuts of the carcase, when offered for sale on the butcher's stall, both as to quantity and quality, and in the same ratio decreasing the coarse and offal parts.

Texture or grain of the flesh, is the difference between coarse open, or lyrey, or black flesh, and fine close grained meat, of a lively, bright red color.

The fattening quality, and the disposition to become quickly fat, and at an early age, is an indispensible requisite to the agriculturist; upon this qualification his loss or gain, in a great measure, depends; and this so essentially requisite, is innate.

The discriminating judgment, unremitting attention, and perseverance during many years, of that celebrated breeder, the late Mr. Bakewell, of Dishly, in Leicestershire, England, produced an improvement in both cattle and sheep unprecedented.—His cattle were of the kind designated as the Lancashire Long Horns, from their having long and very slender horns, and by way of distinction from another race, their rivals and competitors for favor, called the Short Horns, Durham, Teeswater, or Holderness breed.

The most eminent breeders for many years, differed as to the preference of these two classes. During the lifetime of Mr. Bakewell, owing no doubt to his superior management, and unequalled talent at selection and crossing, the Long Horns, may be said to have borne the sway. Yet, notwithstanding his success and example, other spirited agriculturists, distinguished for their judgment and foresight, particularly those residing in the Bishopric of Durham, and that fertile district in the northern parts of Yorkshire through which the river Tees flows, could not be induced to yield the palm to the long-horned race. Of these eminent breeders was Charles Colling Esq., of Kelton, Robert Colling Esq., of Brampton near Darlington, in the county of Durham, James Brown, of Aldborough near Darlington, John Nicholson, of Gipton near Leeds, Mr. Charge, near Richmond in Yorkshire, Thomas Thackerey of Pickhill near Bedale, J. Wade, of Cinderly, Mr. Weatherill, of Fieldhead, &c., practical men of great science, who, differing with Mr. Bakewell in their selections, have, by perseverence and superior judgment, brought the short-horned breed to a degree of perfection, surpassing in beauty, utility and profit, all other cattle of the present day—yielding a larger supply of milk, feeding to greater weight, having a propensity to become fat at an early age, affording fine grained meat, beautifully intermixed with fat throughout, having thin hides, carrying their greatest weight in the hind quarters, and the choice pieces when cut up, yielding a just proportion of tallow, having small bones, with fine clean heads and light necks, void of that great coarse gullet and dew-lap generally the property of heavy cattle; affording a less proportion of coarse meat of little value when exposed for sale on the butcher's stall, and less offal, than any other breed, a thing in itself of great consideration, for if the fattener of cattle feeds a bullock that is by nature coarse, having, before the fattening process commences, a large proportion of weight in those offal parts of little value when killed and cut up, and the animal gains 50 per cent weight, in being fattened, the offal or coarse parts will increase in the same ratio, as the prime pieces, and thus the feeder will have expended provender in increasing the weight of an undue proportion of offal and meat, in place

of that doubly valuable; in addition to which, in the fine formed or fine pointed bullock, will always be found a disposition to throw up flesh and become fat much sooner, and at a less charge for provender than the coarser made animal.

I have now, Mr. Editor, endeavoured briefly to show the advantages to be derived from the possession of this improved short-horned race of cattle, which the breeders of Kentucky and Ohio have happily introduced, a fine specimen of which those of Ohio will have an opportunity of viewing, upon the farm of Mr. Lewis Beach, in the town of Lebanon, in Warren county, about twenty miles from Cincinnati.

Should the foregoing remarks be deemed of interest or utility, I may be induced to extend them.

AN OLD BREEDER OF CATTLE.

For the New-York Farmer.

GREAT SALE OF DURHAM CATTLE.

MR. MINOR—SIR—Being an admirer as well as a breeder of the "Improved Durham Short Horned" Cattle, I attended the late public sale of J. Hare Powell's celebrated stock, consisting of bulls, cows and heifers, in all twenty-five, from eight days to ten years of age.

The animals were turned on to his lawn, in front of his mansion, and seemed conscious of their superiority, as they moved about with all the majesty imaginable.—They were in fine condition, and showed off to the best advantage.

"Whatever differences of opinion may prevail respecting the comparative merits of our several breeds of cattle," says a writer on cattle, "it must be admitted, that the short horns present themselves to notice under circumstances of peculiar interest. Possessing in an eminent degree a combination of qualities, which have generally been considered incomparable, and rendered irresistibly attractive to the eye, by their splendid frames and beautifully varied colors, it is not surprising that they have realized for their breeders enormous sums of money; and that throughout our own island, and in every foreign country where agriculture is attended to, they are in increasing request.

The auctioneer's hammer has unequivocally tested the estimation in which this very superior breed of cattle are held, and I regret to say that Ohio and Kentucky are to receive pretty much all the benefits from them. Although the prices would seem high to some, still, they are much below what the same *strain of blood* could be purchased for in England. I had an opportunity of examining those imported by the Ohio company last August, and think they would suffer in comparison with Mr. Powell's herd, although they were beef.

Below is a catalogue of Mr. Powell's sale of "Improved Durham Short Horned" cattle, at Powelton, April 25th, 1836.

	Names.	Dam.	Sire.	Price.	By whom purchased.
No. 1.	Mandane,	Mary Ann,	Richmond,	$600.	Mr. White, of Kentucky.
2.	Mandane II., 2 yrs.	Mandane,	Bertram,	510.	Mr. Gratz, of Kentucky.
3.	Ohio, 17 mos.	Mandane,	Mercutio,	700.	Mr. Smith, of Ohio.
4.	Belina II., 5 yrs.	Belina,	Malcolm,	560.	Mr. Gratz. of Kentucky.
5.	Belina III., calf,	Belina,	Bertram,	300.	Mr. Neff, of Ohio.
6.	Bertram II., 2 yrs.	Belina, II.,	Bertram,	500.	Mr. Cruger, of Virginia.
7.	Desdamona II. 2 yrs.	Zulinda,	Bertram,	480.	Mr. Martin, of Ohio.
8.	Bertram IV., 5 wks.	Desdamona II.	Bertram II.	260.	J. Purvis, of Penn.
9.	Virginia II. 2 yrs.	Lucella,	Bertram,	500.	Mr. Gratz, of Kentucky.
10.	Virginia III., 2 yrs.	Lucella II.,	Bertram,	440.	J. Purvis, of Penn.
11.	Florinda II., 3 yrs.	Florinda,	Bertram,	590.	Mr. Brent of Kentucky.
12.	Adonis, 1½ yrs.	Belina II.	Mercutio,	260.	Mr. Denning, of Penn.
13.	Blockley, 10 mos.	Virginia II.,	Bertram II.,	305.	Mr. Martin, of Ohio.
14.	Lubin, 10 mos.	Virginia III.,	Bertram II.,	205.	Mr. Morgan, of Conn.
15.	Denton II., 10 mos.	Florinda II.,	Bertram II.,	510.	Dr. H. Thayer, of Penn.
16.	Burletta, 3 yrs.	Burletta,	Bertram,	340.	Mr. Martin of Ohio.
17.	Ruby II., 3 yrs.		Bertram,	290.	Mr. Brent, of Kentucky.
18.	Defiance, 9 mos.	Ruby II.,	Bertram II.,	290.	Mr. Barney, of Penn.
19.	Frolic, 30 mos.	Lady Beauty,	Bertram,	320.	Bid in by Mr. Powell.
20.	Powelton, calf,	Burletta II.,	Bertram II.,	180.	Mr. Harris, of N. Jersey.
21.	Daphne,	Coquette,	Wye Comet,	100.	Mr. Neff, of Kentucky.
22.	Daphne II., 2 yrs.	Daphne,	Emperor,	185.	Mr. Barney, of Penn.
23.	York Belle, 2 yrs.	Martha,	Emperor,	155.	Mr. Barney, of Penn.
24.	Mandane III., 8 wks.	Mandane,	Bertram II.,	150.	Mr. White, of Kentucky.
25.	Bertram V., 8 days,	Virginia III.,	Bertram II.,	120.	Mr. Martin, of Ohio.
				$8850	

Here is an average of three hundred and fifty-four dollars per head, and one-third of them less than one year old. This, I believe, was the greatest sale of Durham cattle ever made in this country.

BEMENT.

We have seldom met with a more interesting and valuable article than is to be found in the Number of the Edinburg Review for January 1836, just re-published here, on the progress and present state of Agriculture in Great Britain; and we think we shall be doing a favor to our readers in laying it before them. We give them a large portion of it in the present number, and purpose to continue our extracts hereafter. British agriculture is not exactly like our own; and practices prevalent in one country, might not with advantage be naturalized in the other; but the extraordinary improvements accomplished, the extraordinary increase of production effected by skill and science, and their bearing upon national wealth and prosperity; and the modes by which these effects have been brought about, cannot fail to be universally interesting and instructive; and to operate as a powerful stimulus and encouragement to an improved agriculture.

BRITISH AGRICULTURE.

The incrense of manufactures and commerce in Great Britain, since 1760 has been so very extraordinary—so unprecedented in the history of industry—that it has engrossed the almost undivided attention of most inquirers into our progress in wealth and civilization. But, how paradoxical soever the assertion may at first sight appear, we are not sure that the improvement and extension of manufactures can, all things considered, be truly said to have materially exceeded the advances made in agriculture. The results of manufacuring and commercial improvement—the great towns, the factories, warehouses, docks, and other vast establishments, and the increase of population and of wealth to which they give birth—arrest the attention of every one, and impress the mind with the most exalted ideas of their produtive powers and capacities. Compared with them, the results of the most improved and skilful agriculture escape the public attention. They are spread over a wide surface; they have nothing striking or imposing about them; a crop of three quarters of an acre does not appear very different from one of four quarters; and a country imperfectly cultivated, especially if it be well wooded, may seem to a common observer, to be little inferior to, if it do not surpass, one that is cultivated in the most approved and efficient manner. It is only when we survey them in the aggregate, when we bring the scattered and singly inappreciable results of agricultural industry into a collected mass, that we become duly sensible of their magnitude and extreme imporiance; and that the panegyrics of the ancients on agricultural industry, seem to be almost as correct as they are eloquent.

The insular situation of Great Britain, and the rigidly enforced regulations under which the trade in corn and other agricultural products has long been conducted, afford the means of establishing some most important conclusions as to the progress of agriculture. If the population has been greatly increased, if all classes be at present better and more liberally fed than at any former period, if the consumption of corn by horses be at least three or four times as great as about the middle of last century; if, we say, all these things have been accomplished, not only without any increase, but with an actual cessation of importation, is it not a clear proof that agriculture has been wonderfully improved? It may not be possible to point out the different modes in which the grand result has been brought about, or to measure the exact influence of each, but of the result itself there cannot,

under the circumstances supposed, be the shadow of a doubt. We shall briefly show that such has been the case.

As to the increase of population in England and Wales, since 1700, it is exhibited in the following table, calculated by Mr. Finlaison of the National Debt Office.

Population of England and Wales, from the year 1700 to the year 1830, includindg the Army, Navy, and Merchant Seamen :—

Years.	Popula.	Years.	Popula.	Years.	Popula.
1700	5,134,510	1750	6,039,684	1800	9,187,176
1710	5,066,337	1760	6,479.730	1810	10,407,556
1720	5,345,351	1770	7,227,596	1820	11,957,565
1730	5,687,993	1780	7,814,827	1830	13,840,751
1740	5,829,705	1790	8,540,738		

We regret we have no similar account of the population of Scotland since 1700 to lay before the reader. Its population at the period of the Union in 1707 is generally supposed to have been about 1,050,00; but it was not till 1755 that it was estimated with sufficient accuracy. At that epoch the population was ascertained, from returns communicated from the different parishes to Dr. Webster, to be 1,265,380. In 1801 it was found by the census of that year to be 1,599,068; and in 1831 it had increased to 2,365,114, or to nearly double its amount in 1755.

Taking the population of England and Wales in 1755 at 6,259,707 (the mean between that of 1750 and 1760,) and adding to it the then population of Scotland, we get 7,525,180 for the population of Great Britain in 1755. But the population in 1831 was 16,539,318, showing that in the interval there had been added to it the prodigious number of 9,014,139 individuals, or that it had increased in the ratio of nearly 220 per cent! An increase of this sort is unparalleled in any other European country, and is to be matched only by the increase that has taken place in the United States.

Now, if we affirm that the improvements that have been made in the agriculture of Great Britain since 1755 have sufficed to provide an ample supply of food for this additional *nine millions* of inhabitants; and if we suppose, which is certainly a moderate estimate, that they consume, one with another, to the value of L.8 a-year of raw produce, it will follow that the progress made in agriculture, since the middle of last century, has added the enormous sum of £72,000,000 a-year, or more than twice the total value of the cotton manufacture, and nearly three times the interest of the national debt, to the free disposable income of the country. It will not be difficult to show that such is undoubtedly the fact.

Mr. Charles Smith, the well-informed author of the tracts on the corn trade, estimated the population of England and Wales in 1760 at six millions, which the previous statements show was very near the truth. He then estimated the consumers of each sort of grain, the quantity consumed by each individual, and, consequently, the whole consumed by man, as follows :—

Estimated population of England and Wales.		*Average Consumption of each Person.*		*Consumed by Man.*	
5,750,000	consumers of wheat,	at 1	quarter each, -	3,750,000	quarters
739,000	do of barley,	at 1 3-8	do -	1,016,125	do
888,000	do of rye,	at 1 1-8	do -	999,000	do
623,000	do of oats,	at 2 7-8	do -	1,791,224	do
	Consumed by man,			7,556,350	do
In addition to this, Mr. Smith estimated the wheat distilled, made into starch, &c.				90,000	do
Barley used in Malting, &c.				4,417,000	do
Rye for hogs, &c.				31,000	do
Oats for horses, &c.				2,461,500	do
	Total of home consumption,			13,555,850	do
	Add excess of exports over imports,			398,524	do
				13,954,474	do
	Add seed (one tenth),			1,895,447	do
Total growth of all kinds of grain in England and Wales, in 1760				15,349,921	do

These estimates are believed to have come pretty near the mark; and they are interesting as showing the variations that have taken place in the food of the people. But whether accurate or not is of little importance to our argument. There is, at all events, no doubt about the fact that the average annual excess of the exports of corn over the imports, did not then amount to 400,000 quarters. This is a matter that does not depend upon estimate or conjecture of any kind; but upon the official returns rendered by the custom-house. But we have imported not foreign corn, or next to none, for the las four years; so that it necessarily follows, that all the vast numbers that have been added sinc 1760 to the population of Great Britain, must be exclusively indebted for their subsistence to the subsequent improvement and extension of agriculture; except in so far as we may suppose this result to be modified by the absorption of the 400,000 quarters referred to above, and by importations from Ireland.

The imports from Ireland amount at present to about 2,500,000 or 2,600,000 quarters of all sorts of grain, from 1,600,000 to 1,800,000 quarters being oats. And, adding to the imports from Ireland the 400,000 quarters exported in 1760, the total extra supply, exclusive of that derived from the improvement of the agriculture of Great Britain, may be taken at nearly 3,000,000 quarters, of which about two-thirds are oats. Now, supposing this quantity were altogether used as food for man, it would not provide for more than 1,200,000, or at most 1,500,000 of the 9,000,000 added to our population since 1755 or 1760. In point of fact, however, not a single bushel of it can be fairly regarded as being so used. The horses at present in Great Britain, over and above those kept in 1760, certainly require at least from eight to ten, instead of three millions of quarters of corn, for their consumption: and, in addition to the vast increase of population, there has been a material increase in the consumption of each individual. Hence, in measuring the progress of agriculture in Great Britain, as we have done, by the mere increase of population, we are very considerably, indeed, within the mark.

To attempt to prove by argument the fact that there has been a wonderful increase in the number of horses since 1760 is, perhaps, presuming too much on the patience of the reader. For every single horse used in posting, in stage coaches, in the conveyance of wagons, vans, &c., along the high-roads in 1760, there are now from twelve to twenty, or more. In some districts there has been a decrease in the number of horses employed in teams; but even in these the total number of horses has been much increased. In Lancashire, the West Riding of Yorkshire, and all the manufacturing districts, the increase in the number of horses has been almost as great as the increase of manufactures: and this also has been the case in London and in all the large towns. We are quite sure that we are within the mark when we say that there are at this moment in Edinburgh, Glasgow, and Dundee, upwards of *twenty-five* horses for every one that belonged to them in 1760. And the improvement in keeping of horses has been quite as great as the increase of their number.

Mr. Charles Smith estimated the consumption of oats by horses in 1760 at 2,461,500 quarters. But no one can be so ill informed as to suppose that this estimate is in any degree applicable to the present times. On the contrary, we are well satisfied, from extensive inquiries made amongst those best informed as to such matters, that the consumption of oats by horses in Great Britain at this moment, is certainly above ten, if it do not exceed twelve millions of quarters. But taking it at ten millions only, it follows, that about five millions of quarters more of British corn, after allowing for the entire imports from Ireland, and for the cessation of the exports, are now appropriated to the feeding of horses than in 1760. Hence it appears that the improvement and extension of the agriculture of Great Britain since the middle of last century, independently altogether of any extrinsic supplies from Ireland or any where else, has been so very great, that besides enabling the country to appropriate an additional five, but more probably seven millions, of quarters to the feeding of horses, it supplies food for very considerably more than double its former population, and those too, living in comparative ease and afflu-

ence. The history of the world may be ransacked in vain for a parallel instance of improvement in any old settled country.

But though there had not been a single bushel of corn expended on the feeding of horses in 1835 more than in 1760, nor an additional individual added to the population, the improvement that has taken place in the interval in the style of living of all classes, would have a good deal more than sufficed to swallow up the entire imports from Ireland, and to account for the cessation of exports. The proofs of this improvement are abundantly obvious. Out of the 6,000,000 of people in England and Wales in 1760, Mr. Charles Smith tells us that 888,000 were fed on rye. But at present we are quite sure there are not 50,000 who use that species of grain. The rye eaters have universally almost been changed into wheat eaters; and, except in the county of Durham, where a mixture of wheat and rye, called *maslin*, is grown, the culture of rye is almost unknown. Nearly the same may be said of the consumption of barley. In the northern counties of England, at the middle of last century, and for long after, very little wheat was used. In Cumberland, the principal families used only a small quantity about Christmas. The crust of the goose pie, with which every table of the county is then supplied, was, at the period referred to, almost uniformly made of barleymeal.* But no such thing is now ever heard of even in the poorest houses. Almost all individuals use wheaten bread, at all times of the year. It is, in fact, the only bread ever tasted by those who live in towns and villages, and mostly, also, by those who live in the country.

It has been the same every where throughout the kingdom. In Cornwall, from thirty to forty years ago, the small farmer, with the agricultural laborers, and those employed in the mines, almost invariably used barley; but at present they do not use it to any thing like the same extent as formerly, and in many extensive districts it has been entirely abandoned.* The same thing has happened in Somersetshire, and in every other county where either barley or oats was formerly made use of. Wheat is now the all but universal bread-corn of England; and in some of the manufacturing towns, within the last few years, the use of the inferior sorts of wheaten bread has been a good deal restricted; and is rejected, indeed, by all but the very lowest and poorest classes.

But great as has been the change in the quality of the food made use of in England during the last thirty or forty years, it is inconsiderable compared with the change that has taken place, during the same period, in Scotland. At the end of the American war, no wheaten bread was to be seen in the farm-houses, country villages, and minor towns of Scotland, and but little even in the largest towns. Oat cakes and barley bannocks were then universally made use of, but at present, the case is widely different. The upper, and also the middle and lower classes in towns and villages, use only wheaten bread; and even in farm-houses, it is very extensively consumed.—It is stated in the first works mentioned at the head of this article, that a field of eight acres sown with wheat, in the vicinity of Edinburgh, in 1727, was reckoned so great a curiosity, that it excited the attention of the whole neighborhood, and that numbers of persons came from a great distance to see it! Even so late as the American War, the wheat raised in the Lothians and Berwickshire did not amount to a third part of what is now grown in them; and we shall certainly be within the mark, if we affirm that the wheat culture has increased in Scotland, generally, in a *tenfold* proportion since 1780.

But the change that has taken place during the last half century, in the consumption of butchers' meat, is still more extraordinary than that which has taken place in the consumption of corn. The quantity made use of has been wonderfully increased, and its quality signally improved. From 1740 to about 1750, the population of the metropolis fluctuated very little; amounting, during the whole of that period, to about 670,000, or 675,000. Now, during the ten years ending with 1750, there were, at an average, about 74,000 head of cattle, and about 570,000 head of sheep sold annually in Smithfield market. In 1831, the population had increased to 1,472,000, or in the ratio of about 218 per cent.; and at an average of the three years ending with 1831, 156,000 head of cattle, and 1,238,000 head of sheep, were annually sold in Smithfield; being an increase of 212 per cent on the cattle, and of 217 per cent on the sheep, as compared with the numbers sold in 1740–50. It consequently appears that the *number* of cattle and sheep consumed in London has increased, since 1740, about in the same proportion as the population. The *weight* of the animal has, however, a good deal *more than doubled* in the interval. In the earlier part of last century, the gross weight of the cattle sold at Smithfield did not, at an average, exceed 370 lbs., and that of the sheep did not exceed 28 lbs.; whereas, at present, the average weight of the cattle is estimated at at about 800 lbs., and that of the sheep at about 80 lbs.* Hence, on the most moderate computation, it may be affirmed that the consumption of butchers' meat in the metropolis, as compared with the population, is twice as great at this moment as in 1740 or 1750.

In most other parts of the country, the increase in the consumption of butchers' meat has been even greater. In thinly peopled agricultural districts very little is consumed, but in manufacturing and commercial towns it is quite the reverse; and their vast increase during the last half century more than justifies the inference, that there has been, at least, a corresponding increase in the consumption of butchers' meat.

In this respect, too, the change in Scotland has been quite as great as that with respect to bread. So late as 1763, the slaughter of bullocks for the supply of the public markets was a thing wholly unknown even in Glasgow, though the city had then a population of nearly 30,000* Previously to 1775, or perhaps later, it was customary in Edinburgh, Glasgow, and the principal Scotch towns, for families to purchase in November, what would now be reckoned a small, miserable, half-fed cow or ox, the salted carcass of which was the only butchers' meat they tasted throughout the year. In the smaller towns and country districts, this practice prevailed till the present century, but is now almost every where abandoned. The consumption of butchers' meat in Glasgow, as compared with the population, does not at present differ materially from that of the metropolis.—We do not, indeed, believe that the command of the people of any country over food and all sorts of conveniences, ever increased, in any equal period, half so rapidly as that of the people of Scotland has done since 1770.

A portion of the increased supply of butchers' meat has been derived from Ireland; but being mostly thrown on a single market, that of Liverpool, this portion appears much larger than it really is. If we estimate the imports of butchers' meat into Great Britain from Ireland, at a tenth part part of the increased quantity produced in this country since 1760, we shall not be within, but decidedly beyond, the mark.

It results from the previous statements,—1st, That the population of Great Britain has been considerably more than doubled—that the prodigious number of *nine millions* of individuls have been added to it, in the interval between 1755, or 1760, and 1831. 2d, That the supplies of corn, and other raw produce obtained from Ireland, are quite insufficient to provide for the increased number of horses kept in the country at present, over and above those that were kept in 1760. 3d, That the population is now, and has been for some years past, incomparably better fed, consuming a much greater quantity of wheaten bread and of butchers' meat, in proportion to its amount, than in 1760, or at any other period of our history. And 4th, That the ports have been shut during the last four years: and that, consequently, the vast additions made to the population, and the signally improved mode of living, have both been provided for, by the extension and improvement of British agriculture. There is not one of these propositions liable to either cavil or dispute—they are all bottomed upon unquestionable evidence. And, having established them, we shall now briefly inquire into the nature and influence of the more prominent of those agricultural improvements, the result of which is, in the aggregate, so astonishingly great.

1. Enclosures are, probably, entitled to rank amongst the first of these. The exten of land occupied by wastes, commons, and common fields, about the middle of

*Sir F. M. Eden on the Poor, Vol. I. p. 564.
* Evidence of Edward Coode, Esq., Report of 1833 on the State of Agriculture, p. 169.

* Sir F. M. Eden on the Poor, Vol. III., Appen. p. 88.—Middleton's Agricultural Survey of Middlesex, 2d edit., p. 541.

* Cleland's Statistical Account of Glasgow, 2d edit, p. 192.

last century, was surprisingly great, and was, indeed, a standing reproach to the country. So late as 1770, fully three-fourths of the surface of Bedfordshire consisted of common fields, and of common or waste land, and yet it was not, in this respect, at all in a worse condition than many other counties. Wastes and commons are not cultivated; fields are, it is true, subjected to the plough, but property in them is so much subdivided and intermixed, that it is altogether impossible to cultivate them to any good purpose. But, since the conclusion of the treaty of Paris in 1763, a wonderful progress has been made in wiping off this stain on the rural economy of the country; and in nothing, indeed, has the progress of improvement been more remarkable than in this particular. The first enclosure act was passed in the reign of Charles II. From the revolution to 1797, the progress was as follows:

	Acts passed.	Acres enclosed.
Queen Anne's reign,	2	1,439
George I.,	16	17,660
George II.,	226	318,778
George III., to 1797,	1,532	2,804,197

It appears from this statement, which is taken from the Report of the 'Commons Committee 1798, on Waste Lands,' that each enclosure act that passed during that period of the reign of George III., which terminated with 1797, enclosed at an average, 1830 acres. Now, the official returns show, that from 1798 to 1832, both inclusive, 2103 enclosure acts were passed; and supposing each to have enclosed, as before, 1830 acres, the total would amount to 3,848,490 acres; making, when added to the quantity enclosed previously to 1798, an aggregate of no less than 6,652,687 acres enclosed since the accession of Geo. III., in 1760. But as it seems probable that the earlier acts applied to a larger extent of land than the later ones, we may, perhaps, estimate the total extent of land enclosed and subdivided by act of Parliament, from 1760 to 1832, at 6,000,000 acres. And it may be safely affirmed that, in consequence of its enclosure, the produce of this immense extent of land has been increased at least from *eight to tenfold!*

2. The introduction of fallows between successive corn crops, was a very great improvement on the previous practice; but the substitution of green crops for fallow, on all but stiff clay lands, has been the greatest of all improvements ever made in agriculture; and has affected as great and beneficial a revolution in it as the introduction of the steam-engine and of the spinning-frame has done in manufactures.—There is abundant evidence to show, that the culture of turnip, as a field crop, was carried on to some extent in several English counties, in the latter part of the 17th century. But the practice spread only by very slow degrees; and it was not till its introduction into the county of Norfolk, in the reigns of George I., and George II., when it was prosecuted on a large scale by Lord Viscount Townshend and others, that its signal importance became obvious. At the period referred to, the whole northwestern part of that country, which has long been one of the best cultivated districts of the empire, consisted of mere sandy wastes, sheep-walks, and warrens, worth little or nothing. These were converted into highly-prodvctive arable land, by enclosing, marling, and the aid of the turnip-husbandry, which is, as it were, the corner-stone of the Norfolk, or improved system of husbandry. The same practices that had produced such splendid results in Norfolk—that had made sandy wastes yield the most luxuriant crops of wheat and barley—have been gradually extended, with similar effects, to many other parts of the kingdom. The produce in corn of the light soils, in all the moderately well-cultivated districts of the empire has, in consequence, been more than trebled; at the same time that a vast supply of green-food has been obtained for the feeding of cattle and sheep, and the production of the most valuable manure.

3. But, signal as has been the improvement in arable husbandry since 1760, the improvements made in stock-husbandry, or in the breeding and fattening of cattle, have been still more considerable. No efforts for this purpose seem to have been made with judgment, and proper perseverence, till after 1750, when Mr. Bakewell, of Dishley, in Leicestershire, began his career.—Mr. Culley of Northumberland, soon after entered on the same course; and the signal success by which their efforts were attended, roused a spirit of emulation in a host of others. But the rapid increase of manufactures and commerce, and, consequently, of the town population, after the Peace of Paris, in 1763, by creating a corresponding demand for butchers' meat, gave the principal stimulus to the improvements that have since been made in stock-husbandry. It is not easy to over-rate their importance. We have already seen that, at an average, the weight of cattle and sheep has been a good deal more than doubled since 1750; so that a stock of 5,000,000 head of cattle, at present, would be more than equal to one of 10,000,000 at that epoch. But the number, as well as the weight of cattle, having been very materially increased in the interval, the supply of butchers' meat must have increased in a corresponding proportion, or been at least trebled. There has, also, owing to the same cause, been a very great increase in the product of wool. The supply of the latter article, produced in England and Wales, in 1800, was estimated at about 384,000 packs, of 240 lbs. each. But, owing to the increased size of the animal, and the greater weight of the fleece, the same number of sheep that produced 384,000 packs in 1800, were estimated by the best informed wool-growers and wool-staplers, to produce 463,000 in 1830, being an increase, in the interval of no less than 20 per cent.* It is true that the quality of the wool has rather deteriorated, for it seems to be impossible to procure both a heavy and fine fleece. Taking, however, the increased weight of the carcass, and the increased weight of the fleece into account, sheep are believed to be more profitable at present, than at any former period; and, for the last three or four years, they have been the most productive species of stock kept in the kingdom.

It would be curious to trace how, in husbandry, as in other things, one improvement grows out of, and is dependent on another. The grand improvement in modern agriculture—that by which it is mainly distinguished from the old—the universal introduction and superior management of green crops, may be in no inconsiderable degree ascribed to the anxiety of the farmers to procure an abundant and suitable supply of food for their stock, the increased demand for the latter being, as already stated, occasioned by the wonderful growth of commerce and manufactures.

The superior attention paid to stock-husbandry, in England may, also, it is probable, be to some extent ascribable to the circumstance of the Tithe pressing, with comparative lightness on pasture and; whilst it falls, with its full weight, on arable land, and operates powerfully to prevent the outlay of capital upon it. But, however accounted for, there can be no doubt, that in all that belongs to the breeding and rearing of cattle, horses, sheep, and pigs, the English are, at present, superior to the Scotch, and to every other people.

It may be worth while to remark, that much injury has arisen from injudicious attempts to improve native breeds of cattle. This has generally been occasioned by prematurely endeavoring to increase their size, which is always determined by external causes, such as the climate, the quantity and species of food the animals can readily obtain, &c. It is to the immensely increased supply and better quality of food, that the increased weight of our cattle is principally to be ascribed. An improved system of breeding would have improved the symmetry of the cattle, and increased their aptitude to fatten; but, without an increase of food, it would not have materially added to their size. In point of fact, too, the latter is an inferior consideration. The grand object that the prudent agriculturist should keep steadily in view, is the obtaining of the greatest possible return for his outlay; and he will prefer that kind of stock, and that breed, of any kind, that will pay him best for the food consumed. The value to which an animal may ultimately be brought, is a subordinate consideration; the profits of breeding, as of every thing else, being determined, not by the absolute price of the produce, but by its price as compared with the expenses incurred in bringing it to market. Mr. Culley's opinion is, that of all animals, of whatever kind, those which have the smallest, cleanest and finest bones, are in general the best proportioned, and covered with the best and finest grained meat; I believe they are, also, the hardiest and healthiest, and most inclinable to feed;—able to bear the most fatigue while living; and worth the most per pound, dead.* It is certain that animals, whether too large or too small, will gradually accommodate them-

* Mr. Luccock's Tables, revised by Mr. Hubbard. See the Report of 1829, on the Wool Trade.

* Observations on Live Stock, p. 222.

selves to the size best adapted to their pastures; but while the larger animal becomes unhealthy, and degenerates in its form and valuable properties, the smaller animal increases in size, and improves in every respect.

The preceding remarks apply exclusively to England and Wales. But though the progress of agriculture there, since the middle of last century, has been exceedingly rapid, it has been low compared to its progress in Scotland. Previously to the peace of Paris, in 1763, agriculture, almost every where in Scotland, was in the most barbarous and depressed state imaginable. There was no rotation of crops; fallows were unknown, except to one or two counties; the process and implements were alike wretched; great numbers of cattle perished every spring; the occupiers were in extreme poverty; and famines were every now and then occurring, that sometimes laid waste extensive districts. At the beginning of last century, and for long after, lands, even in the Lothians, were uniformly divided into *infield* and *outfield*. The whole manure made on the farm was laid on the former, which was ploughed and cropped without intermission, so long at least, as it would bear any thing. Neither turnips, clover, nor potatoes had been so much as heard of; but corn followed corn in an unbroken series. In the *Countrymen's Rudiments*, written by Lord Belhaven, and published in 1723, we are told that the infield of East Lothian, where wheat is sown, is generally divided by the tenant into four divisions, or breaks, as they call them, viz. one of wheat, one of barley, one of peas, and one of oats; so that the wheat is sown after the peas, the barley after the wheat, and the oats after the barley. Here we have a rotation with three consecutive corn crops, and a crop of peas once every four years. As might be expected, the returns were about *three times the seed*. It is of importance, too, to observe, that this trifling return, was obtained at a great comparative expense. At this period, and for about half a century after, there was no instance in Scotland of a plough being drawn by fewer than four horses. Most commonly it was wrought either by six horses, or by four horses and two oxen; and in some of the more backward districts, a still greater number of animals, sometimes as many as ten or twelve, were yoked to it. This was ascribable partly to the awkward and clumsy form of the implement itself; partly to the weakness of the cattle, their diminutive size, and the improper manner in which they were yoked; and principally, perhaps, to the ignorance of the cultivators. On the whole, however, the work was at once very expensive and very ill performed; the ridges were crooked and twisted, and so much heaped up in the middle, that a great deal of land in the hollows between them was lost to any useful purpose.*

About the middle of the century we begin to find symptoms of amendment. In Maxwell's *Practical Husbandry*, published in 1756, an improved system is laid down and inculcated. He pronounces it to be bad husbandry to take two consecutive corn crops; and he informs us, that the best farmers in East Lothian after fallow take a crop of wheat, after the wheat, peas, then barley, and after that oats. This is still very bad; though a material improvement on the practice described by Lord Belhaven. It shows, too, that down to 1757, neither turnips, potatoes, nor any sort of cultivated herbage, formed any part of the system even of the best farmers in East Lothian. The famous Lord Stair is said to have been the first who introduced the turnip culture into Scotland; having raised turnips on his estate of New Liston, near Edinburgh, about the middle of last century. But Mr. William Dawson, tenant of Frogden, in Roxburghshire, has an unquestionable title to be considered as the real father of the improved Scotch husbandry. Being a farmer, and cultivating for profit only, his example had infinitely more influence over his neighbors than it would have had, had he been a landlord. He commenced raising turnips at Frogden, in 1759. They were at first sown broad-cast, but he set about drilling on a large scale in 1763, and his success stimulated others to adopt the same system. Mr. Dawson was also the first who introduced, not long after 1760, the practice of ploughing with two horses abreast without a driver; nor is it easy to exaggerate the obligations the agriculture of Scotland owes to his sagacity and enterprize.* But even in the Lothians, the four horse plough continued in general use till about 1780; and it was not finally superseded by the two horse plough for several years after. In the other parts of the country the former kept its footing still longer than in the Lothians.—Nothing contributed more to pave the way for this important revolution in the method of ploughing, than the signal improvements made upon the construction of the plough by Small, about 1770.

From the close of the American war, the progress of improvement in Scotland has been rapid beyond all previous example. This has been owing to a variety of causes; but principally to the extraordinary progress made in commerce and manufactures since that period. In the distracted state in which Scotland was formerly placed, there could be no considerable progress; but, after the battle of Culloden had extinguished the hopes of the Jacobites, and the abolition of hereditary jurisdictions had paved the way for the introduction of a regular system of government, a spirit of industry and enterprise began to be diffused on all sides. A good many branches of trade and manufacture carried on in England were introduced into Scotland soon after the peace of 1763; and not a few of them were prosecuted with much success. Their progress was checked for a while by the American war; but after the treaty of Paris, in 1783, they acquired more than their former vigor: others were introduced, and all of them have since continued, with few, and those but transient interruptions, to advance with a rapidity that could not previously have been supposed possible.

This unprecedented extension of manufacturing and commercial industry, occasioned a corresponding increase of wealth and population, particularly in towns and villages. Improved accommodations of all sorts began to be in universal demand; and, besides the greater quantity of the inferior sorts of food required to supply the increasing population, a novel, or at least a vastly increased market was opened for wheat and butcher meat. These circumstances had the most astonishing influence over agriculture. The new, and constantly increasing markets, established at their very doors, stimulated the farmers to put forth all their energies, and to avail themselves of discoveries and practices to which they had hitherto been total strangers. In a few years the face of the country was completely changed; and its productive capacities increased in a degree that the most sanguine projector of any previous period, could not have conceived possible.

The following statement of the comparative weight of the produce annually afforded under the system of farming followed in East Lothian, as described by Lord Belhaven, and that which is now followed, is taken from a paper by Mr. Oliver, of Lochend, near Edinburgh, one of the most intelligent practical farmers in the empire:—

"The mode of cropping at the former period (1723) was first, peas; second, wheat; third, barley; fourth, oats; the produce being about three seeds, but to prevent all cavil, say four seeds. This, taking the seed for each acre* at one boll,† over a farm of 100 acres, is 400 bolls.—The quantity of straw for each boll of such a crop could not exceed fifteen stones; which, on 400 bolls, gives 6000 stones, or forty-two stones, fifteen and one-fourth cwt. of straw, to be consumed by the stock, and returned to the land in the shape of manure. But, upon a farm of 100 acres, cultivated as at present, viz. a fourth turnips, a fourth wheat or barley, a fourth clover or rye-grass, pastured or made into hay, and consumed on the spot, and a fourth oats or wheat, the account would stand thus:—fifty acres of wheat, barley, and oats, at eight bolls an acre, which is not above the average of the crops of the best district of East Lothian, and such only was cultivated when Lord Belhaven wrote; this, allowing, as before, fifteen stones of straw for each boll, gives 120 stones per acre, which, over fifty acres, makes in all 6000 stones of straw, being equal to the quantity produced by the whole 100 acres under the old system. Now suppose that the twenty-five acres of clover and rye-grass are made into hay, which, however, is not the best mode, nor that usually followed, and that each acre yields 200 stones, the total quantity will be 5000 stones, or thirty-five tons, fourteen and one-tenth cwt., and add to this 500 tons turnip, being the produce of twenty-five acres at twenty tons per

* Rural Recollections. p. 196.

* Survey of Roxburgh, pp. 69, and 90.

* The Scotch acre, equal to 1.261 imperial acres, is here referred.

† An East Lothian boll of wheat is equal to near four bushels; a boll of barley to near six bushels

cre, which is by no means above a fair average crop. Upon these data, the weight f the materials produced annually, as food or cattle and manure, under the old and new systems, will be as follows:—

Old System,	Straw,	6,000 st.	or 42 tons	15½ cwt.
New System,	Straw,	6,000	42	15½
	Hay,	5,000	35	14 1-10th
	Turnips,	70,000	500	

"Thus making the weight of materials for food and manure under the new system in round numbers 577 tons, while, under the old system, the quantity is only 42 tons, leaving a balance in favor of the new of 533 per annum, being more than *twelve times* the whole quantity produced under the old! Nothing more is necessary to show the superiority of the new system, in so far as keeping up the fertility of the soil is concerned; and upon this depends the progress of agriculture. As to the question of comparative profit, it would be easy to show, from unquestionable data, that the new system is superior to the old in this respect, as it is in the supply of manure; but this must be abundantly obvious to every one who contrasts the almost imperceptible advances made in agriculture, and the accumulation of agricultural capital, for many centuries, with the extraordinary progress during the last fifty or sixty years, or since the new system began to be introduced."

From the Cultivator.

MERINO SHEEP.

MR. BUEL.—I observed, in your last Cultivator, some remarks upon the emigrant merino, particularly the Ramboulet, imported by Robert R. Livingston, Esq. in 1802. Perhaps it would be interesting to some of your numerous readers to know that that breed of sheep is still preserved by the family of that gentleman. Understanding this to be the fact, I visited, last summer, the estate of Robert L. Livingston, Esq., who resides upon the old domain of the late Chancellor Livingston, in the town of Clermont, Columbia county, and there found a beautiful flock of merinos, bearing the characteristic marks of that sheep; and although Mr. Livingston, at present, wishes to increase his flock, he, with the liberality for which he is so justly esteemed, generously permitted me to select a few to commence another pure flock; he informed me, that since the Chancellor's death he has continued to breed in-and-in. The Hon. Edward P. Livingston, who also inherited a part of the Chancellor's flock, has likewise done the same, I am informed.

Since I am upon the subject of sheep, I will observe that the vines of the field bean, with the pods and huska, after the beans are threshed, are excellent feed for sheep. I make this remark because I have seen in some paper, bean vines condemned as useless; and, likewise, upon travelling this fall, a little below the city of Hudson, a large quantity carted into the road and left but to rot upon the ground. Facts are stubborn things. Some years ago I raised two or three acres of the common field or white bean; the straw, or vines, after threshing, I laid away for my sheep, and confined a small flock of them to that kind of fodder entirely, having enough to feed them the most of the winter, and although, after my vines were gone, I fed them with the best of hay, they lost flesh. They will eat all the vines, except the woody part.

Yours, respectfully,

NATHAN BECKWITH.

Red-Hook, January 29, 1836.

From the Cultivator.

CURE FOR THE FOOT ROT IN SHEEP.

The foot rot is an ulceration proceeding from innoculation only, which tends to destroy the hoof; it is most prevalent in low, wet pastures. The rot is so powerful in warm, moist weather, that the ulcerous matter may be discovered within three days after the exposure. The great and first point of cure is, to pare off all the infected part of the hoof, so as to expose the least particle of infection which must be removed; then apply a strong decoction of pulverized blue vitriol, dissolved in water, adding, as used, spirits of turpentine; let them remain in a dry yard a few hours. In all cases, it is of great importance to separate the diseased animals from the flock, and range in dry pastures. When the disease has not been long seated, nor in a manner confirmed, after cleaning the foot, and paring away the infected parts, the application of spirits of turpentine, or a mixture of oil of vitriol, one part with two of water, then dipping it in boiling tar, is an effectual remedy. In the winter, the animal may be infected, and yet you cannot discover any lameness; it is, in this season, too often neglected; if so, when warm weather approaches, it rages again. The best time to cure the foot rot, is cold weather; freezing destroys the ulcerous matter, similar to the infection of small-pox—after freezing, it will not take effect. It is highly necessary to examine them every week, until cured, which will require three or four thorough examinations, where the ulceration is confirmed.

S. W. JEWETT.

Waybridge, Vt. Feb. 29, 1836.

From the Cultivator.

ON THE MANAGEMENT OF PASTURE GROUNDS.

J. BUEL, Esq.—SIR—You will confer a favor upon one of your subscribers, and probably gratify many of the patrons of the Cultivator, by giving some information relating to the fodder or forage for the stock of the wool grower and the dairyman. These two branches of farming are yearly becoming of more importance, and the most expensive part of which is the wintering of cows and sheep. Your views, sir, with regard to the application of our common barnyard manure to meadows, and such land as is not suitable for ploughing—whether in a coarse unfermented state, and applied in the spring or to remain in the yard, and be allowed to ferment through the summer, and applied in the fall, would probably be read with interest. I am aware, sir, that your general mode of manuring land with unfermented manure, is by ploughing it in; but, sir, there are instances where it would be attended with great loss to the farmer, to dispose of his stock, or even a part of it, for the purpose of manuring his meadows in this manner, and it would also require a number of years to accomplish it. I also claim that there is much land in our country, which for various reasons, is totally unfit for the plough, after a smooth surface has been obtained, I should likewise be pleased to read your views relating to the various species of grass, suitable for hay and pasture; but very few of our farmers use but two kinds for seeding their lands, viz: herdsgrass and clover. I have seen the following advertised, and presume many of our farmers are unacquainted with their value, and the proper soils to which they are adapted, &c., viz: white Dutch clover, common white clover, crimson clover, lucerne, Italian rye grass, Pacy grass, perennial grass, prairie grass, orchard grass, red top, Rhode Island bent. To such wool growers and dairymen, whose lands are not suitable for ploughing, the introduction of a species of grass of a more durable nature, than herds grass and common clover, would be important.

If you are disposed, sir, to give your views relating to the above, they will undoubtedly be read with interest in the Cultivator.

Very truly yours, &c.

A DAIRYMAN.

February, 1836.

REMARKS.

Our correspondent's queries relate principally to *old grass grounds*. We confess we have had so little experience in this matter, that our answers must be drawn altogether from theory. The deterioration of grasses arises from one or two causes—1. the dimnution of the more nutritious herbage, in consequence of the exhaustion of their specific food, and the introduction, in its place, of mosses, and coarse herbage; or, 2, the existence of too much water in the soil, or reposing upon a tenacious subsoil, which causes the sole of the sod to be poached by cattles' hoofs, and which encourages the growth of semi-aquatic and innutritious plants. The means of remedying the latter evil is drainage, which may be as advantageous to pasture, as it is to arable or meadow land. The other evil can only be remedied by a change of grasses, or an artificial supply of the specific manure required by those which ought to occupy the ground. New grasses can be introduced by sowing seeds in spring or fall, and scarifying the sod well with the harrow or scarifier, and if short or compost manure can be spared, it should be done before the scarifying takes place. In this way, the mosses will be in a manner extirpated, the surface mellowed, and the seeds covered. An application of lime to the surface, at the rate of ten or a dozen bushels the acre, annually, or once in two or three years, would probably be highly beneficial, by assisting to decompose the dry vegetable matter upon the surface, destroying mosses, and rendering the surface more permeable and retentive of moisture. Marl would almost invariably be a good top-dressing. Gypsum, at the rate of a bushel annually per acre, sown as soon as the snow has disappeared, would undoubtedly benefit all light or dry soils, far more than the expense of buying and applying it. And in many cases a top-dressing of leached ashes would be beneficial. These materials, together with dung, would apply in its unfermented state, in autumn; because it becomes saturated and leached by the snows and rains, and partially decomposed before the grasses start in the spring, and tends more to keep the surface moist during the summer, than short dung, and because it must afford more nutriment to the grasses. Dung wastes much more when fermented in large heaps, than when fermentation goes on in small parcels, or when spread upon a sod.

The article which we have commenced in the first number upon grasses, will afford most of the information desired, as to the relative value of species. It may, how-

ever, be proper here to remark, that the Dutch and the common white clovers are the same; that crimson clover and Italian rye grass are believed to be too tender for our winters, that Pacy and perennial grasses are varieties of rye grass, which are not yet found to succeed well here, on account of the heat and dryness of our summers—and that lucerne is adapted for soiling, rather than pasture. The orchard grass, tall meadow oat and herds grass, (red and white top,) are believed to be among the most abiding, and best adapted for perennial pastures—herds grass and timothy for meadows.

If land is, however, well drained, it may most generally be subjected to the plough, and a year or two of tillage will improve it more for pasture than any topocal application. Improvement of pasture lands is the last thing that engages a farmer's attention. The impression is that they are either not worth improving, or that they are not susceptible of it; when in fact they concern him nearly as much as the meadow or plough land. They make the meat, the wool, the butter and the cheese, more than the meadows do.

From the Cultivator.

AGRICULTURE OF DUTCHESS.

We have often spoken of the agriculture of Dutchess, as exceeding in improvement and profit, that of any other portion of the union; and have ventured to add, that even in this county, the capacities of the soil, and the skill of the husbandman, are yet but partially developed. It appears from official statements, that she sent to New-York, during the last year, of

Wheat, 17,145 bushels. Rye, 42,968 bush.
Corn, 190,092 " Oats, 587,838 "

that of all the *grain* received at New-York, from different parts of this State, she furnished more than one-third, or 838,043 bushels, and which was more than one-quarter received from all places. This was probably wholly the produce of that county; and it is stated that large quantities, not embraced in these returns, were sent eastward into New-England, and much sent to New-York in meal. The aggregate quantity of grain sent from Dutchess during the last year, including meal, is computed, in the Poughkeepsie Journal, at 1,300,000 bushels. But the most remarkable fact is, that the surplus product of grain, sent to market from that county, has nearly doubled in two years, the quantity, in 1833 having been only 479,532 bushels. When we add the meats, wool, and products of the dairy, in which this country is as prolific as she is in grain, we find a confirmation of the excellence of her agricultural management, and the cause of the high price of her lands. "$100 per acre," says the Journal "is ceasing to be regarded as an unusual price for the better class of farms in this county." We have known Dutchess partially for thirty-six years, and have observed her progress in improvement; and we give it as our matured opinion, that the value of her lands, and the profits of her husbandry, have been nearly or quite quadrupled since 1800. But her improvement has not been confined to her husbandry. The improvement of the mind has kept pace with the improvement of the soil. No county can boast of a more intelligent yeomanry, of more social comforts, or of a more healthy state of public morals.

The official report of the inspection of grain at New-York, does not afford a correct criterion of the products of many counties; first, because the counties upon the river are credited for what they send to market, though the grain may come from the interior counties; and, second, because most of the wheat of the great west is manufactured into flour, ere it reaches New-York, and of this no account is embraced in the return. This is our apology for not inserting the entire return.

We give below an illustration of the excellence of farm management in Dutchess, in the practice of Mr. Harris. It will be perceived, that the average product of the whole of the improved lands of this excellent manager, exceeded in value $23 per acre; and that the surplus produce actually sold, after deducting the expenses of labor, &c., amounted to a profit of more than seventeen dollars per acre—equivalent to the interest of $250 per acre. Let the young farmer ponder upon these results, and reflect, that *he has the capacities*, if he will improve them, of producing like results; and let his pride, his ambition, and a commendable desire to become useful and distinguished, prompt him to a diligent and persevering use of his faculties, mental, as well as physical, in the spring-time of life. Every step we advance in the principles and practice of agriculture, tends to enlarge our view, increase our pleasures, and to urge us forward. Every improvement in this art serves to behent the human family.

From the Poughkeepsie Telegraph.

MESSRS. EDITORS—I read in the agricultural department of your paper of the 2d instant, a statement of the products of the farm of Mr. Samuel T. Vary, of Kinderhook, Columbia county, which was published at the request of the Agricultural Society of that county. It looks large, yet having kept an account the last year, I am induced to send you an abstract of it for insertion in the Telegraph, that it may be seen that Dutchess is not only able to keep up, but to go ahead. My statement differs some from Mr. Vary's, as I give in whole numbers what my farm produced, and then what I sold from it. He only gave the sales, among which were four cows, two oxen, and two steers, all beef, which it seems to me, must have been reducing his stock. My farm contains 158 acres; 143 of which are tillable. Mr. Vary has 145 acres of tillable land.

The whole amount of the proceeds of my farm for the year 1835.

190 bushels of wheat	at $1.25,	$237	50
165 do	rye, at 94 cents,	154	69
325 do	corn, at 75 cents,	375	24
900 do	oats, at 50 cents,	450	00
27 do	buckwhe, at at 50 cts.,	13	50
7 live shoats, - - - -		40	00
1200 pounds of pork, at 7 cents. -		84	00
3 calves, - - - - -		9	50
90 tons of hay, at $22 - -		1,980	00
Advance on 26 sheep, -		65	00
60 bushels potatoes, at 25 cents,		15	00
		$3,292	94

The amount of sales from the above.

100 bushels of wheat,	at $1.25,	$125	00
165 do.	rye, at 94 cents, -	154	69
200 do.	corn, at 78 cents,	156	25
700 do.	oats, at 50 cents, -	350	00
7 live hogs, - - - -		40	00
3 calves, - - - -		9	50
75 tons of hay, at $23 50, -		1,762	50
Advance on 26 sheep, - -		65	00
Received for pasture and feed exclusive of my own stock, -		60	00
		$3,722	00

Expenses for labor, &c. on farm,	275 00
	275 00
Nett profit,	$2,447 94

DAVID HARRIS.

Poughkeepsie, March 15, 1836.

N. B. A letter from a correspondent at Wappinger's creek, gives us the product of fifteen acres of wheat, raised in that neighborhood by Mr. Peter Ackerman, which averaged about 37 bushels the acre. It was sown on a clover sod, pastured till July. This is an extraordinary crop for an old cultivated district, and is another evidence of the agricultural improvement of old Dutchess.

From the Maine Farmer.

APPLES FOR STOCK.

We have from time to time published accounts of experiments in fattening pork with apples, which has been done with success and profit. The use of apples as food during winter for stock, has been abundantly successful during the past winter.

Several of our acquaintance have used them for this purpose, and consider them a valuable acquisition to their stores of fodder. Mr. J. Bacon, of this town, informs us that he has fed them out daily to his sheep, and has seldom had a flock of sheep do better during a winter. Several other farmers, who have had two or three hundred bushels, have used them with their hay with good effect. Here then is another reason why farmers should not only preserve their orchards, which they now have, with care, but also set out more, and such kinds as will keep well during the winter. An orchard may be considered as a fixture. When the trees once arrive to the bearing age, they require but very little care to keep them in a thrifty condition. They may be considered as a permanent crop, always planted out, and always ready for the summer.

From the Maine Farmer.

FARMERS CAN DOUBLE THE VALUE OF THE STATE.

What say you to the above assertion, brother farmers? Have you faith enough in your own powers to try it? We have not the least doubt, but that if you really set yourselves about it, you can do it, and very easily too. You can make two spires of grass grow where but one grew before, and that too, without much trouble. You can double your crops of corn, and that too, with a proportional increase of profit. You can increase your crops of wheat, rye and oats, and you can sow twice as much as before, and find a ready market for all you can raise.

You can grow twice as much wool as is grown at present in the State, and sell it for cash down. You can plant the mulberry and grow silk, and from this single article alone, double the amount of cash now paid for the whole of the produce. All these things you can do, with a very little extra exertion, and thereby double the value of the State, in a very short term of years. We have said nothing of raising twice as many bushels of roots, and thereby being enabled to keep twice as many hogs, and causing them to make twice as

much manure as now; but this too may be done.

We know of but one thing to prevent these things being done; and that is a belief among too many of our farmers, that they have arrived to perfection, both in knowledge and practice. Now so far from this being the case, we boldly assert, that there is no man in the State of Maine that yet knows, from practical experience, the *powers of an acre of land*, that is—what it is actually capable of being made to produce. We mean no disparagement to the intelligence and industry, or even skill, of our farmers in general, but we do say that they can both be wonderfully improved, and we have invariably found it to be the fact, that our best farmers are willing to acknowledge this, and are striving to improve themselves and their farms, and all about them, but there are so many *self-satisfied* ones, holding back, and trigging the wheels of those who would do better, that it is at least an uphill work for them. What is the source of wealth either public or private? Judge Buel says it is land and labor; and he adds the following sentiment, which ought to be treasured up in the minds of every farmer in the world. "The more fertility we can impart to the one, and the more intelligence we can infuse into the other, the greater will be the returns they make, and the greater our means of happiness; for it is wealth rightly employed that enables us to multiply not only our own, but the comforts and happiness of those around us."

At this point we will leave the subject for your consideration, proposing to take it up more fully another time.

From Hovey's Gardener's Magazine.

ON THE CULTIVATION OF THE MOST SELECT BIENNIAL AND PERENNIAL PLANTS WITH SOME REMARS UPON THEIR BEAUTY. BY S. WALKER.

———"A breath of unadulterate air,
The glimpse of a green pasture, how they cheer
The citizen, and brace his languid frame!
E'en in the stifling bosom of the town,
A garden, in which nothing thrives, has charms
That soothe the rich possessor; much consoled,
That here and there some sprigs of mournful mint,
Of night-shade or valerian, grace the wall
He cultivates. These serve him with a hint
That nature lives; that sight-refreshing green
Is still the livery she delights to wear,
Though sickly samples of the exuberant whole."

These elegant lines from Cowper, are so full of beauty and soul-stirring spirit, to every lover of Flora, that I have thought them peculiarly adapted to my present purpose as an introduction to a few remarks, upon some of our hardy and beautiful plants, which it is my present intention to make, and which I may, in some future communication, carry out to a more extended length. My observations will be confined to such plants as, in my estimation, are most deserving of the care, and are most likely to reward the novice in the culture of flowers. I shall not address myself to the initiated cultivator; he will seek better authority, and more detailed information; it is to those who have taken only their first steps in the garden that I would presume to offer myself as a guide,—it is the young and the fair that I wish to see engaged in floral pursuits, and, if they are still more ambitious, in the science of botany. It requires but little effort to begin.—The task will not be one of labor, but of pleasure, and perseverance will ensure a reward. Flora may be said rather to give fruition than hope; her rewards are ever in anticipation, and are ever at hand. Let us but for a moment look at her progress; after the healthy recreation of preparing the soil to receive the seed, and it is deposited, the spot becomes sacred, and an object of our anxious care; the germination of the seed is watched untill the plant in its first state is realized; over this we hang in fond anticipation of all that shall hereafter delight our senses in richness of color, delicacy of texture, or sweetness of perfume, and in some cases with all these qualities combined; with the strength of the plant, our cares and expectations keep pace, our sympathies are all called into action, the rude wind or the schorching rays of the mid-day sun, are to be provided against; in some cases, the foilage of the plants, of the same kind, are day by day examined, to ascertain if they in any manner differ from each other in form or color; the least shade in color, the least alteration in form, raises the hopes of the florist; he is full of expectation that his labors will be rewarded with a new variety, that may add lustre to that particular class of flowers, and that his friends, and the floral world, may delight in beholding one of the handmaids of his goddess in *a new dress*. Such my readers, are the delights of the lover of nature, and with all this nearly parental care, he may mingle better feelings,—he may, in the midst of his ecstacy of admiration, remember the divine Being who fashioned and painted the object of his pleasure. The botanist with the world before him, the king and the nobleman with his parks, the opulent merchant with his villa, the cottager with his garden, and the mechanic with his pots and tubs placed at his window, while he toils for his daily bread, are each rewarded to the full, out of the never failing source of pleasure which the garden can dispense. To such of my readers as have made a beginning in the garden, I would say, persevere; to those who think of doing so, would say, delay not; to such as suppose they have no means, I will give a picture drawn from our favorite and amiable poet.

"The most unfurnished with the means of life,
And they that never pass their brick wall bounds
To range the fields and treat their lungs with air,
Yet feel the burning instinct; over head
Suspend their crazy boxes, planted thick,
And watered duly. There the pitcher stands,
A fragment, and the spoutless tea-pot there,—
Sad witnesses how close-pent man regrets
The country; with what ardor he contrives
A peep at nature, when he can no more."

None need be discouraged; a violet will smell as sweet, bloomed in a broken tea-pot as in a China vase; the rose will bloom as fair, and shed its perfume as far, though bloomed in the poor man's tub or crazy box, as in the rich parterre.

The remarks and description that accompany the list of plants annexed, and those which I may hereafter furnish for publication, will, in some cases, be taken from such sources as I may think best calculated to answer my purpose; when I copy from others, I shall give credit by making the usual quotation marks, but I shall not give the author's name. If the plan now proposed shall meet the approbation of the conductors of the "American Gardner's Magazine," and may in any way be acceptable to its readers, I may, as before remarked, continue this subject at some future time; but in saying this much, I do not pledge myself so to do. Yours, &c.

S. WALKER.

Roxbury, March 22d, 1836.

From the Cultivator.

PLASTER BEDS OF THE WEST.

Mr. BUEL—In my last communication, I endeavored to give some general information respecting the quantity of plaster of Paris, or gypsum, quarried, as well as of that consumed in the western part of this State. As I had to speak from information, derived in many cases from hearsay, I have in all probability, (in my endeavor to be perfectly within bounds in my statements,) much underrated the consumption in this quarter of the State.

Perhaps it may not be uninteresting to your readers, or devoid of useful results, to mention a few of the geological indications which are exhibited in the vicinity of the plaster beds, as well as those which accompany them.

In the vicinity of plaster of Paris or gypsum, is generally found common carbonate of lime, and often hydraulic cement or water lime. This is the case in Madison county, and likewise on Seneca river, in Seneca county, near this place. In the latter place, and in Cayuga county, the gypsum rock is sometimes found in a solid body, from ten to twenty-five feet in thickness, extending for an unknown distance, in beds underneath the soil, from three to six feet. Immediately above the gypsum is often a strata of slaty silicious limestone, which, on exposure to the weather, crumbles and breaks to pieces. The soil upon the surface, over the beds, is sometimes a red clay, mixed with limestone, gravel, and sometimes a sandy loam. The plaster is not unfrequently found in the shape of a cone, or a single rock; but in such case more extensive beds are usually to be found in the neighborhood. Sometimes it occurs in laminæ of from one to three feet in depth, with veins of earth or limestone between them; but this is most generally the appearance of the beds at their mouth, or where they are first opened. The rock becomes more solid and of greater depth the farther the quarries are explored. Where the granular or amorphus gypsum is found, (which is the description to which almost all that is *used* belongs,) in strata, of two, three ond four feet in thickness, efflorescences of gypsum are found generally encrusting the different strata. In almost all the rocks on the Seneca river, and in those from the Cayuga and Phelp's beds, are found thin veins, a half an inch to three or more inches apart, of crystallized gypsum, or what the mineralogists term selenite.

In the Medical Repository, vol. 13, p. 77, is the following analysis of the Onondaga plaster, into its constituent parts. The Onondaga plaster resembles in color, appearance, and specific gravity, that from the beds of the Seneca river and Phelps, Ontario county. One hundred grains of the Onondaga plaster, was found to contain

47 parts sulphuric acid, 32 of lime, and 21 of water. And judging from appearances, these are probably nearly the proportions in which the constituent parts of all our gypsum in western New-York are combined. There are some beds of plaster in Cayuga county, which afford a dark blueish specimen, sometimes almost black. This is owing to the presence of argillaceous matter, which gives it likewise a fœtid smell. It is probable that this variety does not contain so much sulphuric acid or lime, as those gray and lighter colored plaster rocks, which are destitute of that fœtid odor, which invariably denotes the presence of argil.

As to all practical purposes for manure, there is no difference between the gypsum of western New-York: though some of our farmers entertain preferences, (according as they have been in the habit of using the gypsum of some particular bed,) in favor of one kind, and some of another. I have known the gray and the blue plaster to be sowed side by side, in a great many instances, for the purpose of experiment, and on all the varieties of soil, and the results were invariably the same; and, indeed, must always be, as the component parts *as to all practical purposes*, are the same. But *quere*, whether that plaster containing *argil*, is as good on *clay* lands, as that which is without it? also, whether it is not better on sandy lands?

The gypsum of western New-York, wherever it appears, is a portion of one vast bed or strata, which extends from Oneida county to the Genesee river, and reappears again in Canada and in Ohio; and I am informed, likewise in the northwest part of Michigan. This strata is of various depths beneath the surface at different places, sometimes upon or near the surface, at other times thirty or forty feet beneath it. This strata does not appear to be of great width. All the beds of gypsum yet discovered in this State, are not forty miles distant from the Erie canal. I believe they are generally south of it.

Mineralogists tell us, that gypsum is found "abundantly over-laying rock salt deposites." I have not heard of salt in this vicinity, though salt has been manufactured from springs at Montezuma, distant about seven miles from the beds in this neighborhood.

Until very recently, the value of the lands upon which these beds of gypsum are found, has not been appreciated. Within the past year, I have known land of the first quality for farming, containing extensive beds of plaster, sold for less than $50 per acre, which is the common price for good farming lands in this vicinity. Considering the few quarries which have, as yet, been discovered, of this valuable minerable, and its increasing consumption, a rapid appreciation of their value in this country may be anticipated. S. J. B.

Seneca-Falls, February 27, 1836.

P. S.—Would not the State be a gainer in a pecuniary point of view, by entirely abolishing all tolls upon the transportation of gypsum and other manure?

From the Cultivator.

MANGEL WURTZEL.

The culture of this root is extending among us; and although different opinions are given of its value, when compared with the Swedish turnip, the preference for one does not necessarily preclude the other. They thrive best on different soils—the mangel wurtzel doing best in a deep, moist, clayey loam, and the Swede on a dry soil, inclining to sand.

The mangel wurtzel is a species of beet, of which there are varieties, differing principally in color. The flesh colored is preferred, as affording the largest produce; though the whiter species, when of moderate size, has been found to contain the most saccharine matter. The soil for this crop should be rich and deep, and if trenched ploughed the better, as roots cannot be expected to grow to a fair size below the stirred earth. Trench ploughing is merely ploughing two furrows deep, by following, with a second plough, in the track of the first. The surface should be perfectly pulverised with the harrow. The seeds should be sown in drills, at 18 to 24 inches apart, the latter being preferred, as it will permit the crop to be dressed with the cultivator. They may be sown with Robbins', or the common drill barrow, or dropped by the hand, in shallow furrows previously drawn, and then covered an inch, or an inch and a half deep. A seed will often produce two or more plants, all but one of which should be drawn out, and the plants thinned to 8 or 12 inches whenever they are so far advanced as to warrant it. Some persons strip the side leavss to feed to cows, when these have become large, but it is believed that this is done at the expense of the future growth of the root. But the crop should be harvested when the plants have matured, which is indicated by the lower leaves changing their color, as after this period, as was ascertained by Chaptal, a portion of their saccharine matter was transformed into potash, and the roots become less nutritious and palatable. If sown the 20th to 25th May, the crop will have time to mature early in October. The product is generally equal, and sometimes larger, than that of ruta baga—often amounting to fifty tons the acre, but twenty tons, or 600 bushels, is a fair crop. This root may be profitably grown in the middle and northern states, though the extreme north is not so well adapted to it as it is to the Swedish turnip. The whole process of culture consists in thinning the plants, keeping down the weeds, and the surface of the soil mellow. They do not require to be earthed or hilled. The seed may also be sown with a dibble, thus: take a strip of plank two or three feet long, and three inches wide; bore a hole in the centre, and fix in it an upright handle, three feet long, with a cross piece at the top to hold by; then bore holes 1½ inches distance, and fit in pins, to project 1½ inches from the bottom, sharpened at the lower points. With this the planter makes holes upon the line of the row with great expedition; a boy follows, drops a seed in each hole, and covers it with his toes. If two feet long upon the base, every impression of the dibble will make a dozen holes. Seeds planted with the dibble are most apt to grow, as they can readily be planted at a required depth, and be covered with fine mould.

The roots may be preserved in the winter in cellars or pits, like ruta baga, though they are less hardy. They are readily eaten by all farm stock, and are found highly nutritious; though all seem to agree in this, that they should not be fed without other food, as hay, straw, or other roots, and should at no time constitute more than two-thirds of the food of a beast. As we have remarked, different opinions prevail as to the comparative merits of this root, with Swedes and potatoes, as food for farm stock. Experiments made under the authority of the Highland Society, in feeding with potatoes, mangel wurtzel, and ruta baga, for three months, produced a like result as to increase of flesh, but the dealers thought the beef of the cattle fed upon ruta baga, some three or four dollars a beast better than the other. The Doncaster agricultural committe, thus sum up the advantages of cultivating this crop:

"It is more sure to plant; being very little liable to the fly or grub. It will produce more crop. It is off the land earlier. It is better spring food. It is useful as a change of fallow crop, when the land is tired of turnips; and can be grown on soils on which they cannot be raised."

On the other hand, in favor of Swedish turnips, it may be said:

"That the weeding and thinning are far less expensive. That there is rather more time allowed for fallowing in the spring. That the succeeding crop is better than after mangel wurtzel; and

"That cattle feed best on Swedish turnips when they are fed alone."

And, *we* add, that with us they may be grown as a second crop after clover.

It should be borne in mind, that the price of labor in Britain is much less than with us; that the mangel wurtzel crop requires great labor, in May and June, before the seed of the Swedish turnip is sown; and that this labor with us, is a matter of no little moment. It is probably advisable that the farmer should sow the beet or turnip, or proportions of each, according to the quality of the soil which is to be appropriated to them.

Sheep Worms.—We hear that many sheep have been lost during the winter, by the worm in the head. This worm is believed to proceed from a fly, which deposits its eggs in the nostrils of the animal in the summer months, where it hatches, makes its way into the head, and often causes death. The general preventive has been the application of tar to the noses of sheep, but the operation requires to be often repeated, and the common mode is attended with so much trouble that it is often neglected. A sheep master has suggested a mode both simple and effectual. It is to take a log or logs, dress them six inches broad upon the upper side, and bore holes with a large augur, 2 or 3 inches deep, and at short intervals, the whole length; fill these with salt, and apply tar with a brush, as often as needed, say once a week, around all the holes, and give the sheep daily access to the salt. In this way the tar may be effectually applied, without the trouble of yarding and handling the sheep.

From the Cultivator.

INDIAN CORN.

All, or nearly all the accounts we have published of great products of Indian corn, agree in two particulars, viz: in not using the plough in the after culture, and in not earthing, or but very slightly, the hills. These results go to demonstrate, that the *entire* roots are essential to the vigor of the crop; and that roots, to enable them to perform their functions as nature designed, must be near the surface. If the roots are severed with the plough, in dressing the crop, the plants are deprived of a portion of their nourishment; and if they are buried deep by hilling, the plant is partially exhausted in throwing out a new set near the surface, where alone they can peform all their offices. There is another material advantage in this mode of cultivating the corn crop—it saves a vast deal of manual labor. See the communication of Mr. Tomlinson, in to-day's paper.

There is another question of interest to farmers, which relates to the mode of harvesting the crop, that is, whether it is best to top the stocks, cut the whole at the ground when the grain is glazed, or cut the whole when the grain has fully ripened. We have stated the experiments of Mr. Clark, of Northampton, one of the best practical farmers of country, and of other gentlemen, showing, that the grain suffers a dimunition of six or eight bushels the acre, by topping the stocks; and there seems to be no counterbalancing benefit in the fodder, unless at the expense of carrying the stocks to the borders of the field, that they may be secured before the crop is gathered, and before they become blanched and half ruined. And it is no protection against early autumnal frosts, but rather exposes unripened grain to be more injured. Hence, so far as regards these two modes, all who have made a comparison, seem to concur in the opinion, that stripping the corn of its tops and leaves, is a bad practice. William Carmichael, of Virginia, has given us in the Farmer's Register, his experiments in this matter, which go to corroborate the conclusion we have drawn. He took promiscuously 100 ears from corn that had been topped, and 100 ears from that which had not been topped, growing side by side. The first weighed, on the cob 50 lbs.—shelled, 41 lbs., and measured 21 quarts, 1 pint. The other, 54 lbs.—shelled, 46 lbs., and measured 26 quarts, 1 pint.

Showing a difference of nearly one-fifth in favor of the unstripped or untopped corn. The fact is, that topping not only prevents the further elaboration of the sap, which can only take place in the leaves, and which is necessary for the growth of the corn, but it deprives the grain of much that is already elaborated, and on its way to the grain. If a fruit tree is deprived of its leaves, before the fruit has attained its growth, or mature flavor, the fruit will no longer grow, nor will it attain high flavor, for its supply of elaborated food, or vegetable blood, is cut off by the loss of leaves. We have noticed this particularly in the plum.

Satisfactory experiments have not been made to determine, whether it is most advantageous to cut the crop when the grain is merely glazed, or to wait till it is perfectly ripe. This will depend upon the amount of loss, if any, in the grain, by early harvesting,—the relative value of the grain and fodder, and the prospect of both being injured by early frosts—for neither are liable to suffer from frost after the first crop has been cut and put into shooks. It is to be noticed that in early cutting, the stalks are succulent, and abound in elaborated sap, on its descent from the leaves to the grain, and that this supply of food to the grain continues to flow probably for some days after the corn is in shook, and if so, the grain itself continues to improve, though we think it likely that the crop undergoes some trifling diminution. But if frost is likely to intervene before the complete maturity of the crop, there is no doubt but the corn will suffer less in shook than it will standing, while the fodder will be materially injured by the frost. Admitting that there is a small loss in grain by early cutting, though it is undoubtedly less than when it is topped, the difference in the value of the fodder, under the two modes of management, is vastly in favor of early harvesting. We do not pretend to calculate to a nicety, the difference in nutritious properties, of corn stalks cut in a succulent state, early in September, well cured and well housed, and those left standing till October or November in the field, but we should think it fifty per cent. Well cured corn stalks afford an excellent winter food for neat cattle; and when fodder is likely to be in demand, they may be made to contribute largely to the profits of the farm. Several of our acquaintance have kept their neat stock almost entirely upon this fodder during the past winter, and we have done the like, having first cut ours in a cutting machine; and so far as we can learn, the cattle kept upon them are in excellent condition.

The preceding considerations justify us in recommending, that in the mangement of the Indian corn crop, the following rules be observed, at least partially, so far as to test their correctness:

1. That the corn harrow and cultivator be substituted for the plough in the culture of the crop.

2. That the plants be not hilled, or but slightly so—this not to prevent the soil being often stirred and kept clean. And,

3. That in harvesting, the crop may be cut at the ground as soon as the grain is glazed.

From the Cultivator.

THE POTATO.

There is hardly any crop about the management of which a greater diversity of opinions exist than this—whether we regard soil, seed or mode of planting and culture. The British Board of Agriculture, with a view to ascertain the best mode of managing the potato crop, addressed a number of queries to the principal farmers in the kingdom, calculated to elicit the facts necessary to determine this point. The circular and the answers were published in a large quarto volume, together with the report of the committee charged with the arrangement and publication of the facts. The statements are so variant, that the committee were unable to recommend any particular practice, as that which was most successful in one case, proved defective in other cases. The only important fact settled by the inquiry, was, that potatoes differed very materially, in some cases fifty per cent, in their nutritive properties, a consideration as material for the stall as for the table. Since the date of that publication, however, very nice experiments have been made in Great Britain, particularly in Scotland, and by Mr. Knight, and also in the United States. From these we draw the following conclusions:

1. That in this latitude the potato is better, both as to product and flavor, when grown on a moist and cool, than when grown on a warm and dry soil—better on a moderately loose and friable, than on a hard compact soil.

2. That they do better on a grass ley than on stubble—and better with long or unfermented manure, than with short muck.

3. That medium sized whole tubers give a better crop than sets or very large tubers.

4. That drills or rows should be adapted to the growth of the tops, and the condition of the soil—the small growing tops nearer, and those having larger tops farther apart—so that the sun may not be excluded from the intervals; and where the soil is stiff, or the sod tough, hills are considered preferable to drills.

5. That if the ground is well prepared, and the seed well covered, they are not benefitted by heavy earthing; and that ploughing among them, or earthing them, after they come in bloom, *is* prejudicial.

6. That the kinds best for the table, are also best for farm stock, containing a larger portion of nutriment than inferior kinds.

While upon the subject, we will mention, that our friend Capt. Joab Centre, who has some time ago left ploughing of the deep for ploughing of the glebe, has invented a potato plough, which is said greatly to facilitate the gathering of the crop. As soon as we become satisfied of its utility from our personal knowledge, we intend to give a cut and description of it.

From the Mechanic's Magazine.

MR. D. K. MINOR,

SIR,—I send you the following receipts for the Mechanics' Magazine, thinking they might be of some service to some of its readers. S.

FOR PAINTING MAHOGANY AND CURLED MAPLE.—For mahogany, give the work a coat of straw colour, made of white lead and yellow ochre; when dry, give a light coat of Venetian red, and burnt terra de sciene, equal parts, and spread very thin. The grain should be put on by a flat brush; some of the dark shades may be made with burnt umber and black, ground together, and applied with a camel's hair pencil. If any part is to be made very light, the straining may be wiped off with a ball of cotton, light stripes may be made by drawing a piece of earth over the work, and taking off the dark color, &c.

FOR MAPLE.—The work stained with yellow ochre and burnt umber, or terra de sciene unburnt, ground together, but as it varies so much in the color from yellow to brown, it may not be depended on uniformly. The bird's eyes and curls are formed by removing the staining with a piece of stiff leather, with the edge cut in notches, so that several of the points will touch the work at once, or the ends of the fingers may be used instead of the leather.

TO IMITATE TORTOISE-SHELL.—Make the ground dark with Venetian red, rose pink and lampblack, it will make a dark reddish brown, then take a coarse sponge, wet it with water, dip it in Venetian red, ground fine in varnish, dot it on the above ground, then take rose pink, and give it a coat over the whole.

A VARNISH FOR INDIA RUBBERS.—Half a pound of gum shellac, one quart of spirits of wine, and two ounces of Venice turpentine, dissolve the gum in the spirits, then add the Venice turpentine, the gum should be dissolved in the spirits, set in warm water or hot sand with the cork put lightly into the bottle.

From the London Mechanics' Magazine.

ON THE STATE OF THE ARTS OF DESIGN IN ENGLAND, WITH A POSTSCRIPT ON TAXIDERMY AND TRAVERTINO.

Sir,—Upon reading your judicious testimony before the Committee of the House of

Commons on Arts and Manufactures, I was struck with a passage (p. 189, 642d No.) wherein you most appositely remark on the "wretched prints," and "still more wretched stucco images," with which this country is inundated by the itinerant *Italian* hawkers. A great portion of the plaister of Paris casts are good, and in good taste; but the prints are all, without exception, the most wretched that it is possible to conceive it possible to execute. Many of the plaister casts, too, are as bad as the prints; and your remarks on this head brought to my recollection a circumstance which tallies most opportunely with them.

Some ten years ago, walking in the country in company with a gentleman of extensive knowledge, and the most correct taste, we met an Italian lad bearing his board of images, most of which were of that horrible sort of rubbish most prized in country places—all daubed with paint, red, yellow, blue, and black. My friend asked the Italian how he could possibly think of selling such *ugly* things, and how he could look on them without being sick? The Italian's reply exactly tallied with that which you, Mr. Editor, gave to the Committee:—"No doubt they consulted the taste of their customers." He said, "*Ugly*, do you say? Yes, they are ugly; but some people's do like them for to be ugly!" and added, in Italian, "*In Londra, possiamo vendere le cose regolare; ma in campagna, ci vuole il colorato e barbaresco.*"—"In London we can sell the *regular* things; but here (in the country,) we must have the colored and barbarous." By-the-bye, I will remark, that the Italian did not mean to attach the epithet of "barbarous" to the colored, merely as colored; though I do not mean to say that he was actually aware of the fact of the ancients, both Greeks and Romans, painting the statues of their gods and goddesses to the natural hues, and clothing them in garments according to the most approved fashion of the day.

I should think that there can be little doubt but that the contemplation of, and the drawing from, good statues or casts, is far more efficacious in infusing a right knowledge of design into the student, as well as good taste and judgment in the public, than engravings, drawings, or paintings, can possibly be. I mean, that *cæteris paribus*, the diffusion of good statues or casts will have a far greater effect in a community than an equal diffusion of engravings and paintings. The *facilities*, however, which occur in the dissemination of the latter, through the innumerable publications which are now accompanied by wood cuts or superior engravings, must give it the lead in the power of general instruction to a community.

Speaking of castings in plaster of Paris, I will mention a circumstance which, I dare say most of your readers will feel aware of, which is, the very imperfect representations of fishes exhibited in museums and collections of natural history, when the stuffed skins of the animals are given as something like unto the originals. When we look upon the stuffed and varnished skin of fishes we have never seen alive or dead, the faults in the representation do not strike us; but let any one look at the preserved specimens of cod, soles, salmon, pike, trout, &c., with the very *phisiognomy* of which he is quite familiar, and he will surely require the aid of the name affixed to the specimen in order to recognise his old acquaintance! Not one of the stuffed fishes of the collections bear any greater resemblance to the real animals, than a stocking stuffed with hay or wool would have any anatomical resemblance, to the leg of a human being! The transformations of the stuffer are truly ludicrous. But it is not his fault; it is the *process*, which is entirely inadequate to the purpose. Birds, and some animals with long hair, such as bears, &c., may be tolerably well represented through the art of stuffing, &c. But has any one seen a stuffed horse? I have, at Paris and elsewhere; and, unfortunately, our eyes are so familiar to the "noble presence," and to every beautiful swell and turn of the limbs and muscles of that noble animal, that the specimens I allude to, although executed by the first artists of the line in the world, might almost be mistaken for apes, or even cows, but for want of the ears and horns! But I am too prolix in the introduction of the trifle I have to present to such of your readers as are fond of fish and fishing, which has been my only diversion for many years. I have been in the habit of catching pike of 19, 12, and 20 lbs. weight; trout of 7, 10, and 11 lbs.; and in Italy, fish of much larger size. I was for some time in the habit of preserving a drawing of the best fish, by laying them on paper and taking the outline, an exact fac-simile as far as that went. I then attempted to stuff some of them, but succeeded no better than the gentlemen of the museums. I then thought of taking a cast in plaster of Paris of the fish, which I executed in more ways than one, all equally satisfactory. First, I took a cast of the fish, and then saturated it with linseed oil, and painted it from nature, so as to be, to all intents and purposes, a fac-simile. Secondly, I skinned the fish, took a cast, and then drew the skin over the cast. Thirdly, I made the cast from the unskinned fish, then skinned it, and drew the skin over the cast. The only difficulty I had was with the skin of the head, but that is of no consequence, and it might be overcome after three days' application. But by painting the cast the most perfect fac-simile is produced, both in form and color; and the latter will not be liable to the changes and blackening which occurs to the varnished skins of fishes.

I fear that you will accuse me of occupying your valuable columns with much trivial matter; but as far as the preservation, or rather *representation*, of fishes and reptiles is worthy of consideration, I think that the "preservers" will be benefitted by this communication.

Another word or two on a subject connected with the preservation of stone and roofs, &c. The stone of which the Church of St. Peter's, at Rome, is constructed, is a calcareous, stalictitious stone, called Travertino, formed by an agglomeration of bushes, leaves, roots, and some shells, by means of a calcareous fluid by which the whole is fossilised. The very process of this formation may be observed in all its various stages of progression and completion, on the road to Tivoli, about twelve miles from Rome. This is an interesting topic, but I must only allude to it in order to introduce the Travertino, which I have to represent as rather liable to honeycombs. These honeycombs when they occurred in the surface of any of the steps, copings, terraces, &c., on the vast surface of the top of St. Peter's Church, were usually filled with melted pitch or some kind of cement; but the great heat of the sun, combined with the action of the air and water, soon melted, decomposed, and dissipated these fillings in. In 1804, I recommended the application of melted sulphur into all honeycombs, cracks, crevices, and junctions in the stone or clinkers, which constitute the top and pavements of St. Peter's Church, which, in extent and appearance, is very much like a small town or fortress. The sulphur was universally applied; and up to 1815, I had frequent ocular proofs that it was no more affected by the sun or atmosphere, than would have been so much pure gold. To this, I will only add, that from subsequent experiments I have found, that by the addition to the sulphur of a small quantity of iron filings, a very hard sulphuret of iron, or artificial pyrites is produced. Copper, or brass filings would probably produce an analogous result.

I have read, with very great satisfaction, in your last number, Mr. Thomas S. Mackintosh's Electrical Theory of the Universe, to which I take the liberty of soliciting the particular attention of your philosophical readers. I shall venture to offer some remarks upon it next week. Meantime, I have the honor to be, Sir, your obedient servant,

F. MACERONI.

PROCEEDINGS OF THE INSTITUTE FOR APRIL, 1836.

April 11.—Annual Election of Officers for 1836–7.

After the meeting was organized, the official canvass of the election was declared, as follows:—

GEO. BRUCE, President.
JOHN M. DODD, 1st Vice President.
ROBERT WALKER, 2d Vice President.
HENRY CUNNINGHAM, Record. Secretary.
LEONARD D. GALE, M. D., Cor. Secretary.
SAMUEL CARTER, Treasurer.

BOARD OF DIRECTORS.

1 Uzziah Wenman, Civil Engineer.
2 Adam Hall, Machinist.
3 Thomas Ewbank, Plumber.
4 Joseph Tucker, Builder.
5 Samuel Roome, Sash Maker.
6 Alexander Masterton, Stone Cutter.
7 Thomas Addison, Pencil Case Maker.
8 Caleb Bartlett, Card Manufacturer.
9 Benjamin W. Clapp, Jeweller.
10 Thomas C. Chardavoyne, Plumber.
11 Elisha J. Abel, Cordage Manufacturer.
12 John Windt, Printer.
13 Robert M. Lang, Carpenter.
14 James J. Mapes, Chemist.
15 George N. Miner, Machinist.
16 William Partridge, Chemist.
17 Robert Smith, Stone Cutter.
18 James Stone, Plumber.
19 Edward Smylie, Grate Maker.
20 Sylvanus S. Ward, Hatter.
21 John Whittemore, Machine Card Manufacturer.
22 James Frost, Engineer and Builder.
23 William J. Mullen, Watch Dial Maker.
24 William Browning, Iron Founder.
25 John Conroy, Machinist.
26 Henry Durell, Paper Stainer.
27 Noah S. Hunt, Machinist.
28 Augustus Campbell, Carpenter.
29 Augustus Cammeyer, Picture Frame Maker.
30 Alexander J. Davis, Architect.
31 William H. Hale, Pencil Case Maker.
32 William Everdell, Engraver.
33 Mahlon P. Green, Carriage Maker.
34 Richard M. Hoe, Machinist.
35 Henry G. Stetson, Bookbinder.
36 Ichabod Hoit, Paper Dealer.
37 Benjamin J. Hunt, Hatter.
38 Thomas Afflick, Painter.
39 John Remick, Shoemaker.
40 Jordan L. Mott, Stovemaker.
41 Peter Baxter, Cabinetmaker.

42 Alexander Laurance, Stone Cutter.
43 Owen G. Warren, Machine Draftsman.
44 Henry O. Kearsing, Piano Forte Maker.
45 Peter Walters, Dyer and Embosser.
46 Martin W. Emmons, Brassfounder.
47 John Johnson, Jr., Blacksmith.
48 Lewis Feuchtwanger, Chemist.

COMMITTEES OF THE BOARD OF DIRECTORS.

1. COMMITTEE OF FINANCE.

George Bruce.
Benjamin J. Hunt.
Edward Smylie.
William Everdell.
Thomas Addison.

2. COMMITTEE ON DONATIONS.

William J. Mullen.
Richard M. Hoe.
Robert M. Lang.
Augustus Campbell.
Peter Baxter.
Augustus F. Cammeyer.
John Conroy.
Henry O. Kearsing.
Peter Walters.
John Johnson, Jr.
Lewis Feuchtwanger.
Elisha J. Abel.

3. COMMITTEE ON INSTRUCTION AND SCHOOLS.

Robert Walker.
John Windt.
Henry Durell.
Henry G. Stetson.
Sylvanus S. Ward.
Thomas Afflick.
John Whittemore.
Thomas C. Chardavogne.

4. COMMITTEE ON READING ROOM AND LIBRARY.

Owen G. Warren.
John Remick.
Benjamin W. Clapp.
Samuel Roome.
Martin W. Emmons.
John M. Dodd.
Henry G. Stetson.

5. COMMITTEE ON LECTURES.

Henry Durell.
Thomas Ewbank.
Wm. Partridge.
Samuel Carter.
Noah S. Hunt.

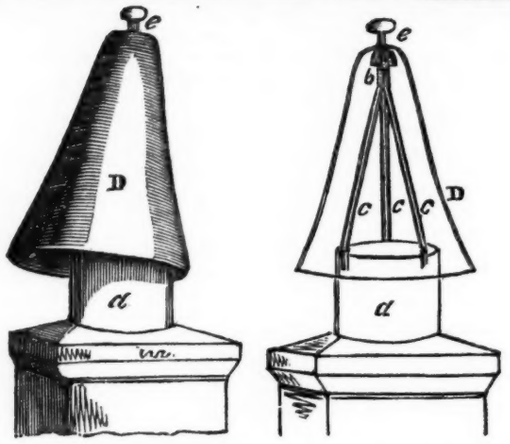
6. COMMITTEE ON PUBLICATION.

James J. Mapes.
Leonard D. Gale.
Thomas Ewbank.
George N. Miner.
Henry Cunningham.

7. COMMITTEE ON ARTS AND SCIENCES.

George N. Miner.
Adam Hall.
William H. Hale.
James Stone.
James J. Mapes.
Jordan L. Mott.
Alexander J. Davis.
Thomas Ewbank.

MOVEABLE HOOD FOR SMOKEY CHIMNIES. (J. G.)—The following is described as a simple and effectual cure for smokey chimnies.



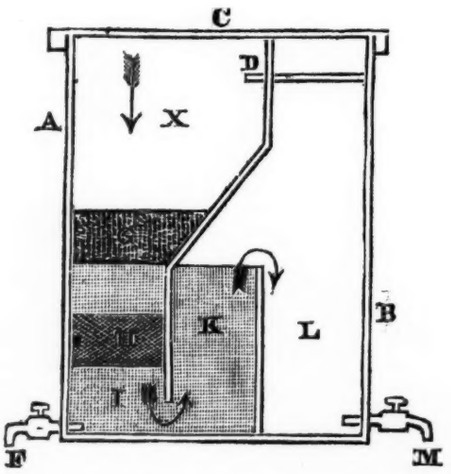
The flue of the chimney terminates in a cylinder of cast of strong sheet iron, (*a*,) one foot in diameter, firmly set in the top of the masonry. Three light iron rods, (*c, c, c,*) rivited to the cylinder *a*, rise about two feet above it, and unite in a piece of iron, (*b,*) of a triangular shape, and three or four inches long, and having a hemispherical termination. The half ball has a hole bored in its upper part, at least an inch deep and one fourth of an inch in diameter, and well tapered to receive the screw *e*, which is provided with a good thumb piece. This screw holds the hood *b* in its place, and serves as its axis of motion.

The cone D is of sheet iron, two feet long and two feet in diameter. When at rest, its base is horizontal. It has a truncation or flattening at the top, four inches at least in diameter, with a hole for receiving the screw. It is made somewhat concave, and the hood must be so adjusted as to turn freely on its axis.

When the wind blows strongly, the hood is pressed against the chimney on the windward side, and the smoke freely escapes on the opposite side.

When the chimney is to be swept, the hood is unscrewed and removed for the purpose, if necessary.

When the wind is variable, the hood is liable to rattle against the cylinder, and occasion an unpleasant noise. This may be prevented, by punching holes round the cylinder, and attaching to it, by means of wire, a band of thick list or double piece of cloth. The hood must extend at least an inch below the top of the cylinder.



FILTRATION OF WATER FOR DOMESTIC PURPOSES. (J. G.)—Many families and individuals are subjected to great inconvenience, and often to the injury of health, by the use of impure water. The water of wells and springs, is very frequently impure, not only from the ingredients which it holds in solution, but from earthy and foreign matters suspended in it. From the former, that is, the saline and calcareous matters which are completely dissolved in it, and which render it hard and unsavory, it cannot be deprived by filtration merely, but from those foreign substances, which destroy its transparency and make it turbid and unpleasant, the filter is an effectual remedy. Besides, there are few dwellings, whether in situations where the well water is naturally hard and injurious, to those who drink freely of it, or otherwise defective, from which, with a little attention, rain water may not be caught in sufficient quantity to answer for cooking and drinking, and this when passed through the filter we are about to describe, is perfectly fit for these uses.

The cheapest kind of filter, and at the same time, one of the best ever used, is the following.

A B, is a wooden box made of pine plank,

which should be previously boiled several times in water, to remove all the resinous or soluble parts which give taste to the water. C is a cover with a rim, and D is a sliding board, to keep the filtered water faom dust. X receives the water to be filtered, which first passes through a bed of coarse gravel G, terminating in fine sand, and then through a bed of charcoal H, coarsely pounded, and again through sand, resting on fine gravel I. From this, the water passes through an opening one and a half inches high, at the bottom of the partition, into the compartment K, which contains only fine sand. The compartment L, receives the filtered water, which is drawn off through the stop cock M. F. is a cock for emptying the machine when necessary for cleaning.

The sand and gravel must be carefully washed before using, and the charcoal carefully selected and free from taste. If this box be nine inches square at the bottom, and thirteen inches high, it will be sufficient for an individual. Larger dimensions may adapt it to family use, and if made higher in proportion to its breadth than the above ratio, the filtration would be more thorough. The materials should be renewed once in five or six months, or oftener, if necessary.

Fig. 1.

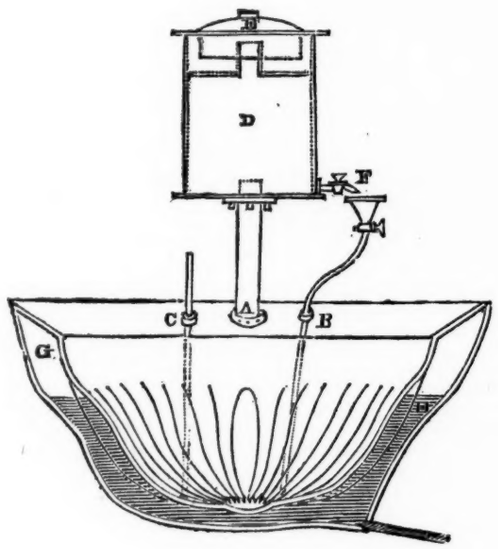
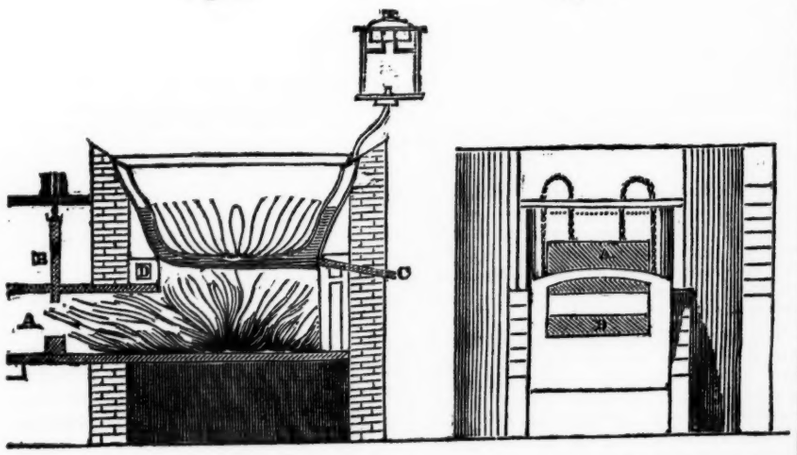


Fig. 2.

Fig. 3.



DR. URE'S PATENT CORRUGATED SUGAR-PAN OR TEACHE.

The pan is made of cast-iron, and is double. Between the outer case, which is evenly, and the inner one which is corrugated into a double surface, there is a space for containing a liquid medium, which is unalterable by the fire in any length of time, and serves as a bath to transmit a sufficient heat to boil the syrup very quickly, but intercepts the scorching temperature which turns it into molasses. The sugar, therefore, cannot be burned in the inner pan, and the fire need never be extinguished, as at present, when a skip is struck. Thus, much time, labor, and fuel, are saved. The pan may be set up by any bricklayer, at the end of the ordinary range of coppers in a colonial sugar-house, where the finishing teache now stands; or it may be worked by a separate fire at the pleasure of the planter, and may have the spare heat of its flue applied to the clarifier-coppers.

Fig. 1 is a section of the double pan Being as tight as a bottle, and withou seams or joints it is not liable to leak, like pans made of copper, which must be rivetted or brazed. G is the vacant space between the two pans for the play of the bath-liquor during the time of skipping, when no evaporation is going on in the inner pan. H shows the level of the bath-liquor about two-thirds up the side corrugations. A is a bent pipe, three inches wide, for connecting the space between the pans, with an iron drum D, called the condenser. Any watery vapor which may occasionally exhale from the bath, when overforced by fire, rises freely up the pipe A, and is condensed into water in D. The water thus condensed is quite pure, and is allowed to trickle slowly down through the stop-cock F into the funnel beneath it, from which it runs back into the bottom of the medium through the pipe B, and thus preserves the boiling pitch of the medium always at the requisite temperature. The best heat of the medium for boilng sugar quickly without discoloration has been found to be from 300 to 310 degrees of Fahrenheit's thermometer, but it may vary a few degrees up or down without inconvenience. The temperature of the bath may be made higher or lower, at the pleasure of the boiler. By merely preventing some of the water that exhales into the condenser D from returning into the bottom of the bath, the temperature is raised; and by pouring slowly a little more water into the bath through the pipe B, the temperature is lowered. A few quarts of water added make a difference of several degrees in the heat of the bath. E is a light basin of cast iron inverted over the open top of the safety-pipe of the drum D. The edges of the basin rest on 3 iron props, and dip an inch deep, or thereby, into some water poured round them, in the upper space of the drum. This arrangement forms a water-valve, which allows air or steam to pass freely to and from the bath-space between the pans, but at the same time cuts off the open communication between the external atmosphere and the bath liquor. This liquor consists of a strong solution of caustic potash, and may be preserved any number of years in a perfect state for sugar-boiling, by this plan of seclusion from the open air. Should the body of medium after a long time absorb so much carbonic acid or fixed air, as to impair its action as a bath, it may be easily made caustic again, and thus restored to its original state, by boiling it for half an hour in a copper with half a hundred weight of fresh slaked quick lime, and six times its bulk of water. This lime-mixture being allowed to settle a night in the large copper in which it was boiled, must be ladled off into smaller copper in successive portions, and boiled down till its boiling pitch rises to 290 degrees, or thereby. The copper should be partially covered with boards during this boiling up, and whenever the liquor is concentrated enough, the copper should be closely covered with boards or mats, till the liquor has become cool enough to be poured into the bath space through the aperture at C or B (unscrewed for this purpose,) by means of a funnel, or a stone pitcher with a spout.

The flange A, of the bent pipe, is made water-tight to the brim of a pan by a lead-washer, and is fixed down firmly with screw bolts, having square heads. The funnel-pipe B, with the lengthening piece for introducing water into the bottom of the medium for regulating the temperature of the bath, is fixed in its place by a union-joint screw turned by a screw-key or wrench. The thermometer tube-case has a flange,

with lead-washer at C, by which it may be screwed tight into its aperture. Into this tube which is shut bottom, an inch or two of quick silver is to be poured, or sufficient for covering the bulb of the thermometer. This quick silver lying always in the tube, takes the temperature of the medium, and immediately imparts it to the thermometer, on dipping its open end down into the bottom of the quick-silver. The thermometer, after some experience in boiling with the pan, need only be used occasionally, as in the morning and afternoon. It shows at once, whether the bath is too hot or too cool, so that a little water may be poured into it through B in the former case, or a little of the condensed water in D, allowed to run to waste, by the stop cock in F, in the second case.

The condensing-drum D, must be propped in its proper position, while its being fixed on to the brim of the pan by the screw-bolts of the flange A. When the pan is briskly at work, both stop-cocks for regulating the medium may be shut, and slightly opened only when the pan is charged afresh with syrup; or the stop cocks after a little practice, may both be left always slightly opened, whereby the pan will become self-acting, by the circulation of a little vapor into the condenser, and a return of it in the state of water to the bottom of the bath. Water poured on the *surface* of the dense medium does not incorporate with it, and therefore has little or no effect upon its temperature.

Fig. 2 is a section of the patent pan when set as the first of the range. A is the flue leading to the other pans. B B, the shuttle-valve, or dampers of fire-brick, by means of which the orifice of the flue may be lowered when required; thereby allowing the flame to have less contact with the bottom of the patent pan. C is the medium discharge-pipe, to be made use of only on finishing crop, when the medium ought to be run off into an iron drum, where it would remain free from the influence of the atmosphere till the following season. D D represents the circle of fire-bricks upon which the patent pan is seated.

Fig. 3 represents more clearly the action of the dampers, as previously shown. These are placed betwixt the patent pan and the second of the range. A and B are the two dampers, equal in weight, and consequently of easy adjustment. When the dampers are furthest apart, the patent pan is receiving the full influence of the fire, but as they approach each other the flame is sucked more rapidly through the diminished orifice, and is in consequence allowed less contact with the bottom of the patent pan.

By these means the fierceness of the fire, as applicable to the patent pan, may be completely controlled, without the least waste of fuel; for while little of the heat is acting upon the patent pan, more is made available to the other pans of the range.

The medium is carefully prepared under the superintendence of the patentee, in a laboratory fitted up on purpose, and is sent out in a state ready for use, in an iron drum-tank, packed in a cask. The orifice of the tank is closed with a screwed iron plug, having a lead-washer under its flange. On taking out this plug with a common screw-wrench, the medium must be poured by portions into a stone or metal pitcher, and thence into the bath-space between the pans; the discharge-hole at the bottom of the pan having been previously closed tightly with its screwed pipe, and flange with lead-washer. At the other end of this short pipe there is a stop-cock, which is never to be opened but when the bath-liquor is to be drawn off at any vacant period, for the purpose of making it caustic again after some years' use. This stop-cock should in general be incased in brick-work or mortar, to screen it from idle fingers. The bath-liquor is corrosive to skin and wood and should not be put into wooden vessels or much handled; if a little happens to touch the fingers, it may be washed away with a little water. Should some of the medium be found to be congealed, the bottom of the open tank may be plunged in boiling water for a little, or surrounded with blazing cane-trash, and half a gallon of hot water may be poured in to wash out the remainder.

Should the junction of the outer and inner pans, at their brims above, become in the least open at any time, they may be made secure again, by packing them with iron cement, made of ground iron borings sal-ammoniacs, well mixed, in the proportion of six pounds of the former to one ounce of the latter, and very slightly damped with water.

When fire is first applied to the pan, after the proper charge of medium has been introduced into it, the progressive heating of the bath must be carefully observed by means of the thermometer, standing in the quicksilver tube C. If the temperature rises to 290 degrees, or thereby, the pan is ready without discoloration. A charge of such syrup may be boiled off into good sugar, by the patent teache, in half an hour, and into fine syrup for shipment home, in half that time. At the instant of running off the granulating skip into the cooler, the firing should be suspended, and resumed as soon as the fresh charge of syrup is introduced. The pans have a shelving brim, to which the usual sloping saddle of lead or mortar cement may be most conveniently adapted, for allowing the juice to froth up without boiling over. The bath is a constant magazine of heat, by which the hot syrup is made to boil briskly immediately after its introduction, so that not an instant is lost in the operation of a sugar house. This pan is also more easily managed than the simple teache, as it cannot by possibility burn the juice, the fierceness of the fire merely agitating the bath for a little, without affecting the quality of the sugar. When there is no syrup in the corrugated pan, the medium should not be forced with a strong fire, as having no evaporable liquor to transfer its heat to, it might possibly boil up a little into the condenser. Even in this case no evil could result, since the moment that the fire becomes moderate, or that fresh syrup is put into the inner pan, the drop of medium which may have been forced up into the condenser D, can be run back into its proper place, through the stop-cock F, and subjacent funnel-pipe.

For some time after beginning to use the pan, it is proper to look every two or three days into the state of the bath, and to measure the depth at which it stands. This is conveniently done, at any interval of the boiling, by unscrewing the quicksilver pipe C, lifting it perpendicularly up, and noting how high the wet mark of the medium is. If it corresponds with about the middle height of the side corrugations, all is right; if it shows the medium to stand lower, a few gallons may be poured in from the spare tank. Too much medium is not advisable, as it merely heats the sides of the pan above the level of the granulated skip, and as it leaves too little space for the free play of the medium exposed to a fierce and fluctuating fire.

NEW APPLICATION OF CAOUTCHOUC.—India-rubber has been applied in Paris to the casting of steel busks for ladies' stays, and it is said to answer well in resisting the metalic oxides upon the dresses.

CAST AND WROUGHT-IRON WHEELS—It was also stated, that where cast-iron wheels on rail-ways would only last six or eight months, wrought-iron would serve at the same work three or four years.

SUGAR FROM BEET-ROOT—Messrs. Fies and Haverwald, of Quedlingburg, in Westphalia, have discovered a process, whereby, in twelve hours, ten lbs. of pure sugar, perfectly chrystalized, may be extracted from 100 lbs. of beet-root. The secret was immediataly purchased by M. Brokhoff, of Wisburg, for 20,000 francs, with the condition that it should not be used beyond the provinces of the Rhine and Westphalia.—[Lond. Mechanics's Magazine.]

NEW EXPERIMENTS GN THE MEANS OF PRESEVVENG WHEAT FROM SMUT.

BY M. MATHIEU DE BOMBASLE.

Translated fOr the Farmers' Register from Annales de 'l Agriculture Francaise.

I commenced in the fall of 1331, a series of experiments having for their object to investigate the best means of preserving wheat from the smut, which often causes to agriculturalists very considerable losses, in their harvests, and besides injures the product so as greatly to diminish its value. I have continued these researches during four years, subjecting to my experiments the means, till now regarded as most efficacious, together with a great number of others.

I have at length come to a conclusion which I may consider as perfectly satisfactory, and I may announce that hereafter it will be easy for all cultivators to obtain with certainty, by the aid of very simple means, creps of wheat entirely free from smut. I have already published some details relative to my experiments the two first years, and I shall now give an account of those, the results of which have been established by the harvests of 1834 and 1835. I shall precede this statement by a summary of the experiments of the two former years.

The most remarkable reesults of my first years' experiments observed in the crop of 1832, were these: lime and common salt employed separately offer very inefficient preservatives; but by combining these two substances in certain proportions, we obtain an action much more powerful for the destruction of the germs of smut; and this action is greatly superior to that of sulphate of copper, or blue vitriol, whether employed alone, or combination with common salt, as is often practised.—The sulphate of copper had been considered till then, according to the experiments of M. Benedic Prevot, as the most powerful agent that could be opposed to the disease of wheat; and it was already an important gain to have discovered a more efficatious action in substances that may be

placed without danger, in the hands of the agricultural population; for when we are aware of the heedlessness which attends all their operations, we cannot but be alarmed at seeing farm servants handle in considerable quantities, a substance so poisonous as sulphate of copper.

Besides lime, the sulphate of copper and common salt, I subjected to my experiments in this year, potash, the sulphate of iron, and sulphurious acid; employing these various substances either separate or combined with each other in different manners, and in different quantities. Many of these preparations were completely inefficacious; some of them were more or less injurious to the germinating faculty of the wheat itself—and for those which showed some power as preservatives from smut, it had been necessary to employ the process of steeping, to obtain a somewhat efficient action of the preservative agents; that is, it had been necessary to immerse the grain in solutions of the different substances, and to let it remain there in maceration a longer or shorter time. It has been long known that this plan gives great effect to the preservative agents, and Arthur Young considered it necessary, from the result of his experiments to let the grain remain for twenty-four hours in water, impregnated with lime.—Mr. Bosc, in the article *Carie*, in the new "*Cours complet d'agriculture*," presents the same indication from the results of the experiments of M. Tessier. I will observe here, that in the same article, this author, proceeding by theoretical analogy, attributes to potash a preservative faculty as powerful as to lime, while, according to my experiments, carbonated potash, as it is found in commerce, exerts no action whatever on the smut. In the same manner M. Bosc, relying upon the theory, prescribes, as superfluous, the mixture of common salt, or of any other salt with lime; whereas, the facts prove that this mixture exerts an action incomparably more powerful than either of the substances taken separately. So true it is, that in every thing that relates to organized bodies, the facts themselves must be consulted, and not scientific theories or analogies.

The following year, in a series of twenty seven experiments, I continued to subject to proof in various combinations, lime and common salt, and I added to these, carbonate of soda, combined in different proportions, with the lime as well as the *chlorure* of lime employed alone in solution, and in divers proportions, and the hydrochlorate [muriate] of lime. These results confirmed perfectly those of the preceding year; as to the efficacy of the mixtures of lime and common salt employed for steeping, they showed again that lime employed alone by sprinkling has little effect, and that the hydrochlorate of soda [common salt] and the hydrochlorate of lime, have scarlely any, nor has the *chlorure* of lime. Besides I did not succeed in obtaining from any of the agents employed a sufficiently powerful action without using the steeping process; and as I was much interested to discover a preservative means, by the more simple and easy process of sprinkling, I determined to pursue my course of experiments the following year. In fact, those persons who have recommended the use of steeping wheat for liming, do not know how much difficulty this process occasions in country farming. This trouble is so great, that there is not, I believe, one farm, in a thousand, on which the grain is limed by steeping; and every where the practice is confined to sprinkling, although it is known that steeping is much more efficacious. I considered it then very important to find out a process by sprinkling, which should be at least equally efficient with the use of steeping, as practiced by a very small number of farmers.

My experiments of the succeeding year, were therefore directed to investigate the efficacy which might be expected from agents applied by sprinkling. I subjected to these experiments, lime, the carbonate, the hydrochlorate, and the sulphate of soda, using the lime alone, in various proportions, with various modes of application, as well as combining with it, each of the three salts in different proportions. The number of smutty heads in the sowing made of wheat artificially infected with smut, was five hundred and seventy in a thousand. By sprinklings with white wash of lime in different proportions, some of which were in enormous quantities, I succeded with difficulty in obtaining a diminution of one half in the proportion of smutty heads. In the beds sown with wheat treated with mixtures of lime, and the three salts, which I have just mentioned, the proportion of smutty heads was still very great, and generally from two to three hundred in a thousand: from these I must except, however, a single one of the beds—the result of which, struck me forcibly; it had been treated with lime and sulphate of soda,* and it was ascertained that it did not contain a single smutty head. It was the first time since I had devoted myself to experiments of this sort, that I had obtained in the result, the complete destruction of the germs of smut in wheat infected to a very great degree, as was that which I used; for after treating the wheat in the preceding years even with sulphate of copper, or lime aided by the process of long steeping, there had still been from eight to twenty smutty heads in the thousand; and after treating it in like manner by steeping, with a mixture of hydrochlorate of soda, [common salt] and lime, the most efficient combination which I had till then met with; there were still found two smutty heads in a thousand. But here there was not one smutty head in more than twenty thousand that the square contained! Yet on the side of this one, and in the neighboring squares, I had beds treated with the same substances in proportions almost exactly equal to those of this exempt square, and they had given from two to three hundred smutty heads in a thousand. As I am in the habit of keeping exact notes of the most minute details of experiments of this kind, I examined these notes with care, and discovered that the square free from smut had indeed been treated with the same substances as the others, but with a mode of management a little different. In all the operations made with lime, and one of the three salts above mentioned, the infected wheat had been first sprinkled with a certain quantity of slaked lime, and mixed with care; afterwards the solution with which the experiment was to be made, was poured upon the wheat, and it was mixed again. By adopting this order, I could make the mass absorb a greater quantity of the solution—but in a single one of these operations, and for some unimportant reason, an opposite order had been observed; that is, the wheat had been first wetted with the solution; and when the mixture had been well made, the grain still wet, had been sprinkled with the same quantity of lime as the other. I had never at that time had any idea that this difference could produce any effect on the results; but this square, as has been seen, was the only one free from smut. On consideration, I concluded, that when lime, or a mixture of lime with a solution, was first used, it might be conceived that the lime incrusts the surface of the grain, so as to weaken the action of the other agents; while if the surface of the grain, and the dust of the smut are first wetted with the solution, they are much better impregnated with it; and that the lime, coming after, modifies in some way the solution with which these bodies are impregnated. Nevertheless, however striking was the fact observed, this explanation was but a conjecture, which it was necessary to test by new proof. Consequently, I made no publication of my experiments of that year, and repeated the course of them by new sowings in the autumn following.

In these experiments the same steps were followed as in those of the years preceding; a double *decalitre** of seed wheat was first artificially infected with smut; afterwards a piece of ground was divided, as equally as possible, into squares of 25 *metres* length;† separated from each other by paths one metre wide; and in each of these squares was sown, with the most minute care, one half *litre*‡ of infected wheat, either in its natural state, or subjected to the various prepartions intended to destroy the infection. This year, however, in order to make a nearer approach to the ordinary circumstances of practical agriculture, I did not infect the wheat to as great a degree as had been done in the preceding years, in which the grains had been completely blackened by the dust of the smut. On this occasion, the dust was added only in a sufficient quantity to alter the color of the grains perceptibly to the eye, without making them black; only the extremeties of the grains covered with down were completely blackened; and in fine, this wheat was affected and injured by the smut to a degree greatly beyond what is ever met with in the markets, and was such as would never find a purchaser.

This wheat, thus infected, and sowed

*The sulphate of soda is what is commonly known as Glauber's salts.—Ed.

*The decalitre is equal to 2.2009667 gallons English, (or American,) or rather more than 2 and one-fifth.—Ed.

†The metre is equal to 3.2808992 English, or nearly 3 and three-tenths.

‡The litre is 1.760773 English pints, or a little more than 1¾.

without any other preparation, gave when gathered, a hundred and forty-three smutty heads in the thousand, whereas, in the preceding years, the infection carried to a much higher degree had given from five to seven hundred. All the preparations of this year were made by means of sprinkling, but the liquid was applied first, and the lime afterwards, as has been just explained.

Lime alone employed in this way, after wetting the grains with pure water, or white wash; and in the quantity of from one to two kilogrammes* to the hectolitre,† presented the proportion of two, seven and twenty-four smutty heads in a thousand.

Lime, in the quantity of two kilogrammes to the hectolitre. first made into whitewash, with a solution of a demi-kilogramme of common salt, or hydrochlorate of soda, gave still two smutty heads in the thousand.

Lime, in the quantity of two kilogrammes and common salt in a proportion that varied from five hectogrammes to two kilogrammes, the whole to the hectolitre of grain, but applied separately, first wetting the grain with the solution of salt, offered not a single smutty head in one case, and produced from one to three in the others.

Lime, in the same quantity as above, united, with sulphate of soda also in the same proportions, and with the same mode of management, showed not a single smutty head in the three squares which were subjected to this preparation.

This result as is seen, fully confirms that of the preceding year, and we have henceforward, in the use of sulphate of soda united with lime, a preservative means against smut, not only superior in efficacy to all those which have been known till now, but even of an efficacy which may be called absolute; since it did not leave a single smutty head in the four squares—in which it was used during the two years, and which contained together more than eighty thousand heads of wheat; and since, it has even completely destroyed the germs of smut in a sowing, infected to the extreme degree of that of the year 1833. This means, so powerful, consists in the use of substances of very low price, presenting no risk to men or animals, and with a mode of application the most easy, and least troublesome.

I will give presently, the details of the process of liming as it ought to be performed according to my experiments, reducing the quantities to the hectolitre, as I have done in the preceding notices; but some very important considerations ought to be first presented. From the commencement of my experiments I had ascertained that certain preparations, at the same time that they exert their action on the germs of the smut, tend also to injure, in different degrees or even to destroy entirely the germinating qualities of the wheat. This is a point, to which certainly not enough attention has been paid up to this time, and of which no mention is made, I believe, in any of the writings published on this subject. It has probably very frequently happened that crops of wheat have been thin, and unproductive, without a suspicion of the cause, which was to be found in a liming made in an improper manner. In the course of my experiments, I have particularly remarked this injury to the germinating faculty of wheat in sowings treated with sulphurous acid, with carbonate of soda united with lime, or even employed alone, either for steeping, or sprinkling. The same observation was made in sowings sprinkled with common salt and lime; when I endeavored to increase the efficacy of these agents, by repeatedly wetting the grain thus treated, with water during twenty-four hours. These observations induced me, in my experiments, to pay particular attention to this property of the agents employed as preservatives from smut, and each year the effects produced in this respect by each of the preparations made use of, have been ascertained with care, by means which it would be too tedious to specify in this place.

In a publication made last year, a distinguished agriculturalist of the neighborhood of Paris, announced that he had entirely lost his sowings of wheat on large fields, from having, in liming it, diluted the lime with cows' urine, instead of the drainings of the dung-hill, which he generally uses for this purpose. Many other similar facts have remained unobserved, or been known but to few persons, from the general reluctance of farmers to publish the result of their operations. In relation to the particular fact of which I have just spoken, I will say that it is quite common for farmers to mix with the lime and other mineral substances which they use for liming, different very strong manures, such as the liquids above mentioned, the dung of pigeons, or fowls, &c., &c. It is evident that, in the minds of the men who have adopted these means, the addition of such substances was designed to give greater activity to the vegetation of the wheat—at the same time, that the germs of the smut were destroyed by the lime, or other mineral agents; for it is not probable that any one could ever have supposed, that manures could, of themselves, destroy the principle of the smut; but the design which they must have had in this, is founded in ideas entirely erroneous as regards the nutriment of vegetables. In the first days which succeed the development of the germ, the seed itself furnishes the only nourishment which can support the germ, and this nourishment consists in principles of a particular nature, formed in the seed to accomplish this object. Art has never yet discovered any substance which can substitute the kind of milk that is produced in the seed, at the period of germination; and if we would subject to experiment all the preparations which have been pointed out to give more activity to vegtation at this period, we should find them all inefficient or injurious. It is the radicle which is first developed, and it has already acquired a considerable growth when the germs of the stalks rises out out of it, to reach the surface of the earth, where it acquires a new development, which enables it to respire the atmospheric air. Till this moment the life of the plant is altogether interior; it is the life of a *fœtus* in the womb of a mother, or in an egg. The animal fœtus can receive no nourishment from without, until its respiatory organs have been brought into contact with the atmosphere, and it is exactly the same with the vegetable kingdom. It is only at the period when the cotyledons are sufficiently expanded to absorb atmospherical air, that is, when they have acquired the green color of leaves—that the radicle is able to extract from the soil which surrounds it any nutritive substance; but at this time the radicle is quite long, and has descended from one to two inches below the point, at which the grain was deposited in the soil. How could it be supposed that the minimum quantity of manure, with which the seed was impregnated, could then be imbibed by the radicles which are unable to absorb any thing except by their inferior extremities? On the other hand, during all this time of its first growth, the young plant is very delicate, and may easily be destroyed by agents which might have served it for nutriment at a more advanced period of vegetation. Hence it is, that if oil-cake be spread in the same drill with the seeds of wheat, beets, buckwheat, and the whole be covered with earth, &c., scarcely any of the seeds will come up, as I have ascertained by repeated experiments. It was certainly by an action analogous to this, that the cows' urine, in the case just mentioned, produced such disastrous effects. The same agriculturist had formerly used in liming, without inconvenience, the drainings of the dunghill; but as this liquid may vary considerably in its nature, according to the age of the dunghill, and to the species of animal from which it is formed—and according as it is more or less weakened with water, or more or less concentrated, in consequence of rains, droughts, &c., &c., it might be very possible that employed under different circumstances, it would produce very bad effects; and, as mixtures of this sort can be useful in no way, I think it would be better to dispense with them altogether; and to employ only pure water as a solvent or vehicle of the preservative agents.

I shall conclude this article by giving, in detail, a description of the most effectual mode of liming, as established by my experiments. In my various operations, I have used the sulphate of soda in quantities, which have varied in the proportion of 1 to 4. As the germs of smut have been completely destroyed by the weakest as well as the strongest dose, or seeds infected to the highest degree—I shall here give the weakest ae being sufficient in every case. I should say, however, that in making use even of the greatest proportion, I have ascertained that this mixture has no injurious influence on the germinating faculty of the wheat.

Description of the process.—The sulphate of soda of which I speak in this place, is a salt which is produced in great masses in the manufacture of soda—and which may be procured at all the druggists' at a lower price than common salt; it is not at all poisonous; a solution of it in water will preserve its properties for a long time, and

* The kilogramme is 2.20548 pounds avoirdupois, or rather more than 2 and one-fifth.

† The hectolitre (100 litres,) is 22.009667 gallons—little more than 23 gallons, or 2 and six eights of a bushel.

it may be prepared beforehand for the whole duration of the sowing season. —As for the lime, it should be taken in lumps and slaked by the addition of the small quantity of water necessary to reduce it to powder, or dissolve it. It ought to be applied newly slaked, and if it is necessary to keep it for some time it should be preserved from the contact of the air, by placing it in a barrel with the head out, and covered first with a linen cloth, on which should be spread, to the depth of a couple of inches, some substance in a dry powder, such as ashes, well dried sand, &c. Whenever any of the lime in powder is taken out, this covering should be immediately replaced: if this precaution is not adopted, or is inconvenient, the lime should be slaked as it is needed, and that which has been slaked for two or three days, should be rejected. All these precautions are generally dispensed with, in the various uses of lime; because when it has been slaked, it preserves for a very long time the same exterial appearance; and to judge of it only by the eye, it would be supposed to be always the same substance; but in proportion as the lime absorbs the carbonic acid of the air, which is rapidly done, it loses its alkaline quality, and becomes as inert as powdered chalk.

The sulphate of soda should be first dissolved in pure water, in the proportion of 80 grammes to the litre, or 8 kilogrammes to the hectolitre: as this salt does not dissolve readily, it would be well to perform this operation the night before, shaking the liquid repeatedly till the salt is well dissolved. The grain to be limed should be placed in a heap on a floor of mortar, flag-stones, or level pavement; it should be watered by means of a common watering pot, and at the same time workmen, furnished with shovels, should mix and stir up the grain rapidly. The watering and stirring should be continued till all the grains are well wetted over their whole surface, and until the liquid begins to flow away from the heap, which indicates that the grain can receive no more: this operation absorbs about 8 litres to the hectolitre of grain; but it would be useless to measure the liquid, and it is sufficient to observe the rule just given. As soon as enough of the liquid has been received, and while the grains are still quite wet on their surface, the lime in powder is immediately sprinkled, stirring the mixture briskly all the time, and lime is added till it reaches the proportion of two kilogrammes to the hectolitre of grain. When the mixture is complete and all the grains are equally covered with lime, the operation is finished, and the seed thus prepared may either be sown immediately, or kept for several days. As it has not imbibed as great a quantity of water as it does in the operations performed by steeping, it is not necessary to spread it out in thin layers, and it may be left in the heap without danger of heating: it is however advisable to turn the heap over every three or four days.

The quantity of lime that I have directed does not require a great degree of exactness, so that the trouble of weighing, every time the quantities used, may be dispensed with; it will be sufficient to ascertain, by weighing once, the quantity contained in any vessel convenient for this purpose, for instance, a porringer, or some such thing; and the same vessel may be always employed as the measure of the quantity of lime for each operation. Such a vessel should always be provided before hand, and the lime should be prepared and ready for use; for it is very important that this should be sprinkled upon the grain at the very instant it is wet upon the surface, for if a delay of some minutes should occur in sprinkling the lime, the solution would be previously absorbed by the substance of the grain, and the lime would no longer act in the same manner.

If this method is pursued with the precautions that I have directed, wheat infected with smut, to the highest degree may be confidently sown, with a certainty that it will not produce a single smutty head, at least in consequence of the disease of the seed. Some persons believe that smut may still be introduced into the crop from other causes; for my part, none of the facts which I have been able to observe, either in my agricultural practice, or in the course of my particular experiments on this subject, authorize me to subscribe to this opinion; and I am inclined to think that the facts upon which it may have been established were the result of an imperfection in the mode of liming hitherto employed.

SHEEP HUSBANDRY—IMPORTANCE OF HOUSING FLOCKS—RAVAGES OF THE WHEAT WORM.

JUDGE BUEL—SIR—I have taken the first and second volumes of the Cultivator, and can truly say that I have taken much pleasure and satisfaction in the perusal; besides having been already more than ten times remunerated for the expense, in a pecuniary point of view into the bargain. Feeling an anxious desire for its continnance and prosperity, I have procured twelve subscribers for the third volume, and send you enclosed six dollars.

The communication of your correspondent, L. F. Allen, Esq., on farm buildings, and the management of farm stock, &c., in the eleventh number of the second volume, I very highly appreciate, and commend it to the careful perusal of every reader of the Cultivator. He says, "if I cut fifty tons of hay, and, by exposure in stacks to the weather, only forty of it can be eaten by the cattle, and one quarter part of that even is trampled under foot, I had better have had only thirty tons of good hay in my barn, and even then my stock would have consumed five tons less by being warmly housed for the winter." This is a view of the case which I think must strike every thinking mind, and will apply itself to every domestic animal on the farm. To my own mind it has been most strikingly presented by a year's experience, and I am of opinion that the difference in the consumption of food, for the domestic stock of a farm, taking in all the losses incident to the forage itself by want of housing, &c., is at least thirty per cent, compared with the most economical method of expending it; and in some cases even forty or fifty! In speaking of his present management and manner of feeding, he says, "I well know that they consume less of food per head by thirty per cent, than they did during the last winter, when they were fed nearly, if not equal to the ordinary method practised throughout the country. Our oxen, I am satisfied, perform more labor, the cows yield more milk, and all the animals consume less food by being thus housed and attended." Is not this then a subject worthy the careful consideration of every farmer? I think it is: and from more than twenty years experience in housing and feeding cattle in mangers, if anything was wanting in corroboration of his testimony, to induce farmers to try it, I would cheerfully add mine. Instead of tying them in stalls, however, I have substituted gates between each one, the advantages of which are, they are more easily, and in less time, put up and turned out, and are not so liable to injure themselves, and cannot possibly injure others, as they sometimes do, by getting loose, when tied.

For eight winters past, including the past, I have kept from 100 to 180 sheep—merinos crossed with Saxony—which I have also fed under cover, and am not sensible that it has had a tendency either to diminish their appetites, or injure their constitutions, in the least; but am satisfied that the preservation of their health requires this indulgence, and nature prompts to it. In the language of an able writer, I would ask, "if they have the choice, do they remain in the open air in a storm?" From eight years experience, I know they do not —"they as instinctively run to their covering as a man does to his house, and if they do not require it quite as much, they appear as grateful for the shelter. For a flock of poor sheep, a protection from the weather is very important. Those in good condition do not so much want it, as they have a better coat both of flesh and wool; but for them it is likewise useful." In giving an account of the management of my flock, for several years past, I cannot do it better, perhaps, than by adopting in a great measure, the language of an able correspondent in the first volume of the Cultivator. Generally by the 20th of November, (sometimes earlier,) I separate my flock in the following manner: In one yard I put my last spring lambs; in another I put my yearling ewes and wethers; in a third my elder ewes, and in the fourth my wethers, where they are kept and fed during the winter. This arrangement I consider highly important. They are now nearly of a size in each yard, and by being so, there are no strong ones among them to drive the weaker from their fodder, but all will feed alike and do well. I usually feed three times a day, rather sparingly than sumptuously, with good hay, and occasionally give to one or more of my flocks, as I think they require it, a few oats, a little corn, or potatoes. If my hay has not been salted, I allow salt constantly to lie in their troughs, that they may lick it at pleasure. Water I also consider almost indispensably necessary, while feeding on dry hay, and therefore allow it to each of my flocks, if possible. Many, I believe, die for want of it. I have sometimes, likewise, had a fifth, or hospital yard, for my old and poor sheep, (if I had any,) and if there were any in either flock that did not subsequently do well, they were removed into this yard, where, by being few in number, and having a good warm shed, well littered, and a little better feed and attention paid to them, they generally soon began to improve and do well. I have, sometimes, actually had my hospital sheep in a

better condition, with this care, by spring, than any other flock. I have, however, now and then, lost one, either by casualty or old age; and in the winter and spring of 1832, I lost sixteen with the grub or maggot in the head, which baffled all my skill and care. I tried many experiments, such as blowing scotch snuff up their nostrils with a quill, and injecting snuff and vinegar up their nostrils with a syirnge; also, French brandy, asafœtida, dissolved in water, the strong juice of tobacco, and spirits of turpentine; but was not successful with any, as every sheep that was taken, died. I therefore know of no certain remedy for this disease, but am satisfied from experience, that a case will rarely occur if sheep are kept in good condition, and their noses are well tarred as often as once in three or four weeks, during the months of June, July, August and September. For the want of a little care and trouble, at this season of the year, many large flocks are almost entirely destroyed the following winter, while their owners blame their bad luck, but not their bad management. Sheep to do well through the winter, must be in good condition when they begin it. If they are so, they pass through it without difficulty; but if they are poor at that season, good provender and a regular supply of it, will hardly ensure them well through. To take good care of our sheep, then, during the summer and fall, is highly important to the farmer, which will be to him a great saving, both in sheep and fodder. To permit them to ramble over our fields in the fall, after the hard frosts of October and November, have destroyed the nutritious qualities of the grass, and until they are driven in by cold and snow, as too many farmers do, is to my mind, poor economy indeed! and if they generally, were aware of the prejudicial effects of such a practice, both to the sheep and to their own interests, would they not be willing to profit by the wisdom and experience of their neighbors? and bring up their sheep earlier into winter quarters, where they can be better fed, before they begin to fail in flesh.

To demonstrate to the satisfaction of the inexperienced, the advantages of feeding sheep in winter under cover, in barns or sheds, I will add that in the winter 1825–6, I fed fifty-seven sheep, (my entire flock,) in the open air, in yards from racks, and in June following sheared from the same 163¾ pounds of wool, averaging 2 pounds 14 ounces per head. In 1826–7, I fed eighty-four in the same manner, and in June following sheared 225 pounds 10 ounces of wool from the same, averaging only two pounds 11 ounces per head. The next winter my flock (101) were fed in the same manner, and in June I sheared 279½ pounds of wool from them, averaging 2 pounds 12 ounces per head. But from three years' experience, and close observation, I was led to doubt the utility of feeding sheep on the ground or in racks in the open air, in winter, and in the summer of 1828, I built me a barn for their particular accommodation, and have since fed my entire flock under cover, to my entire satisfaction.

In June, 1829,	from	105,	I sheared	313	lb.	averaging a trifle less than 3	lbs.	per head.
" 1830,	"	92,	"	293¾	lb.	averaging 3 lb. 2¼	oz.	per head.
" 1831,	"	114,	"	425	do.	3 11¾	do.	
" 1832,	"	125,	"	396	do.	3 2¾	do.	
" 1833,	"	103,	"	348	do.	3 6	do.	
" 1834,	"	130,	"	462	do.	3 8	do.	
" 1835,	"	166,	"	521	do.	3 2¼	do.	

From the above it will readily appear at a glance, that at every shearing since I have fed under cover, my flock have produced upon an average, from two ounces to one pound more wool per head, than when fed in the open air; and I verily believe that I have saved at least, 25 per cent in fodder, besides a great number of sheep and lambs. Every farmer knows, that by foddering sheep on the ground, or in racks, especially in the fall and spring, and in rainy weather, much of the hay is wet, trampled under their feet and wasted. But here, in a barn, or under a shed, it is perfectly dry; and if not eaten, is not destroyed. By carrying it into the yard, other stock will readily eat what is left by the sheep. Here, also, they are exempt from the cold and wet storms in the spring that are so deleterious to their health—especially to old and very poor sheep, and to ewes with lamb. I have, I believe, three or four seasons, within seven years, reared from forty-five to fifty lambs in a season, without losing one. My actual sales of wool and sheep for eight years past, amount to $1,703.13, and the increase of my flock is now worth three hundred dollars more. In conclusion, I would say to my brother farmers, "go thou and do likewise." I must desist from giving a plan and description of my barn, for the want of room.

And now, sir, if you think any of the foregoing is worth publishing, you are at liberty to do it, after making the necessary corrections, &c. Respectfully yours,

ROBERT MILLARD.

P. S. The wheat crop in this section of the State, has been more or less injured, I believe, for twelve years past, by what is here called "insects in the head." "These insects or maggots prey upon the kernel while growing in the field, and before the grain has become hard." In 1824 I had a field, containing 5 or 6 acres, about half destroyed, and for 4 or 5 years my entire crop was destroyed. In 1830, I abandoned the idea of trying to raise wheat here, and have not since sown any. A neighbor of mine wishes me to say, however, that for two years past he has raised fine crops of spring wheat, by sowing his seed the 1st of June. Not an insect or maggot was to be found in either crop. R. M.

Hampton, Washington Co., N. Y. Feb. 27, 1836.

From the Maine Farmer.

CULTURE OF WHEAT.

FRIEND HOLMES,—Believing, as I do, that the cultivation of wheat is of more importance to the interests of Maine than almost any subject which has claimed the attention of the agricultural community, I have determined to give you the result of my recent observations on this subject.

Seven years since I commenced making a farm on that *third* class of land, which had been wholly passed by as worthless by the first settlers. It is a level, sandy loam, on a substratum of sand about six feet thick—next comes clay. Above this last is always abundance of water, varying in depth at the different seasons in the year. Drowth has never yet injured my crops. Early frosts preclude the *folly* of attempting to grow Indian corn. Early planted potatoes and Ruta Baga grow remarkably well.

I have now one field of sixty-four acres, and my mode of culture is the following,—two years to small grain, and two years to clover. When I commenced, it was covered with old hemlocks, bushes and brakes. It was cleared and ploughed in summer, and sowed to grain the two following seasons, and seeded thoroughly to clover. I now plough sixteen acres in September, and when I can get them, put one bushel of leached ashes on every square rod.

In 1834 I purchased a part of this field, which was in various states of culture or wildness. A part had been mowed several years, a few acres only one and two years, and was well into clover—some was uncleared of logs and briars, &c. Thirteen acres, in the various states, was ploughed in June and July,—mostly cross ploughed lightly in the fall, and when harrowed smooth, 180 bushels of leached ashes to the acre, applied to three-fourths of it—between 30 and 40 loads of barn yard manure was spread on the rest, which was the part which had been mowed to death.

On the first days of May, I sowed on this piece 21 bushels and 25 quarts of wheat, prepared in the following manner—6½ bushels soaked in blue vitriol water, 2 oz. to the bushel, and dried with plaster—8 bushels washed clean and dried in quick lime—the remainder, about 7 bushels, soaked in quick lime water three days, at which time the sprouts were starting—dried with plaster. On only one head was a particle of smut discovered.

Three bushels more were washed in water and dried with plaster and sowed in another field which was very smutty when harvested. For sixteen years previous I had used, as I informed you last year, 2 ounces of blue vitriol to the bushel, and never had any smutty wheat. Hence I infer that so far as smut is liable to be continued by the seed, any caustic sufficiently strong to destroy weak seeds will prove a remedy.

This field averaged more than nineteen bushels to the acre—200 bushels of which made 41½ barrels of flour. None of which has sold for less than eight, and some as high as nine dollars per barrel. That part of the field where I ploughed in the clover, produced at least twenty-five bushels to the acre. That on which the manure was spread was very light and full of weeds.

The three bushels in the other field was on what is called *strong* land, on which I had corn and potatoes the year previous, and on which, in 1834, I put 60 loads of manure. This produced only 15 bushels to the acre of inferior wheat.

From all I have been able to learn by reading, hearing, and seeing, the growing of wheat will at least be found a much more simple process than has been generally believed. I believe any ground on which there is a heavy burden of clover, wheat may be grown, with no other dressing than ashes, lime or plaster, to advantage.

It is a natural inquiry if my land will bear the rotation I have mentioned with no more manure than I shall be able to return to it, with the occasional addition of ashes, lime and plaster. This I cannot yet answer; but this much is pretty certain, that when such falling off happens, I shall be informed of it in a manner not to be mistaken. The moment I ascertain this, I will turn in the crop of clover every fourth year in June or July, and rest one season. This is the Dutch mode in New-York and Pennsylvania. This mode gives me but little fine hay—none, indeed, from this field, but so long as I can have clover, straw, wheat bran, roots and Greene's straw cutter, I will risk starvation coming to my barn.

I have heard a great deal said about the impossibility of carrying on farming by hired labor. Although this may be true under certain circumstances, it is, or should be, far from a *general* rule; and the belief in it, has been an immense injury to the farming interest. If a man finds that nature, education, or situation have not qualified him to manage a business requiring one or more hired hands, he does well not to employ them. But if it be otherwise with him, it is scandalous perversion of his powers to fold his arms and grumble at high wages. True, others have other business which enables them to *give* or *promise* greater wages than the farmer can well afford; but if the prices of produce on the whole, are equal to other things, it matters little to the man who has a surplus. The higher every thing is, the more is that surplus worth, so far as dollars and cents are concerned.

Yours truly,

JAMES BETES.

Norridgewock, April, 1836.

From the Cultivator.

REMARKABLE LARGE CORN CROP.

Mr. JESSE BUEL—It affords me pleasure to be enabled to resort to your very useful agricultural paper as a medium through which I can bear testimony to the value and importance of the soil of our little State of *Delaware*.

Little has been heretofore known, beyond its own limits, of the superior quality of the soil of the peninsula of Delaware and Maryland, and of its advantageous location; but the present age of improvement has, fortunately, brought within a part of our territory the public improvements of a canal, and two railroads, which have developed to the world the importance of our location, the beauty of our country, and the susceptibility of our soil, to the greatest extent, of production and improvement. These improvements appear also to have infused new life into our citizens, and caused a spirit of enterprise and industry which has been most beneficial to the agricultural interests of our country.

As a specimen of the capability of the soil, and the ability of the farmers in the neighborhood of St. Georges, New-Castle county, Delaware—permit me to present you with the following statement of a crop of corn, raised last year, by *Maj. Philip Reybold*, one of our most enterprising farmers—one, to whom, our community are largely indebted for the impetus given to our agricultural improvements—viz:

On one field of 22 acres, he raised 2,216 bushels, about 100¾ bushels per acre.

On another field 30 acres, he raised 2,249¾ bushels, about 75 bushels per acre.

On do. of 27 acres, he raised 1,819 bushels, about 67¼ bushels per acre.

79 acres—total crop 6,284¾ bushels—averaging for the whole crop of 79 acres, near 80 bushels to the acre—and all this upon a soil that was not naturally as good as a greater part of the soil of this country; and brought up, within the last ten years, from an extreme state of poverty.

I have obtained from Maj. Reybold, a statement of the mode adopted by him, for an improvement of his land, as well as the cultivation of the crop of corn here referred to, which is as follows: On the field of 22 acres, about 7 years ago, he put 60 bushels of stone lime to the acre, and planted it in corn; in the following spring he put it in oats, and in the fall put on about 40 loads of barn yard manure to the acre, and sowed it in wheat and Timothy seed, and in the ensuing spring with clover. It remained in grass until last spring, receiving an intermediate top dressing in 1833, of 40 loads of barn yard manure per acre. He mowed it for 3 or 4 successive years, and each year obtained from 2½ to 3 tons of hay per acre. Last spring he gave it another top dressing of 40 loads per acre of long manure, which was permitted to remain as long as possible, in order to give the grass a chance of starting through it. He then ploughed it up about ten inches deep, with a No. 5 concave plough, which completely covered the manure; he then gave it a stroke with the harrow along the course of the plough furrows, and then crossways, and struck it out very shoal, 3½ feet from centre to centre each way. After the corn came up, he harrowed it both ways with the fallow harrow; and from that, until the first of July, he gave it three dressings with the cultivator (fluke harrow,) first crossing the plough tracks; in ten or twelve days, the other way, and then again the other way, being very careful not to disturb the manure by going too deep with the cultivator. The plough was never used in the field after planting, and the corn thinned so as to leave 3 good stocks in the hill. When the corn became fit to top and blade he cut it off by the ground and put it up in shocks.

The field of 30 acres—one half he covered with oyster shell lime, 100 bushels to the acre, and 5 acres with marl, 12 loads to the acre; and previous to planting in corn, the whole field was covered with 40 loads of long manure per acre. The produce of the ground on which the lime and marl were put, was about equal, and exceeded that of the ground which had not the benefit of the lime and marl, about 12 to 15 bushels of corn per acre, as near as he could judge. The field was planted and tilled in the same way as the one described. In order to test the advantage of the cultivator over the plough, for tilling corn, he had 5 rows in this field that he lapped the furrow to, with a plough, previous to going over it the last time with the cultivator. He soon discovered that the growth of these five rows fell short, in heigth, of those adjacent, and yielded one-fifth less corn.

There is no doubt but the true mode of tilling corn, especially where sod ground is used, is, to plough deep, and to use nothing but the fallow and fluke harrow for its cultivation. By not disturbing the sod ploughed down, it remains there as a reservoir of moisture, and an exhilarating principle throughout the season, to the growth of the corn.

The third field of 27 acres was covered with about 30 loads of manure to the acre, in the spring of 1834, and 6 or 7 years ago, 60 bushels of stone lime, per acre, was put upon it. The planting and mode of cultivation was the same. I might here remark, that all the second, and a part of the third field, were in corn, the year before last.

JAMES N. SUTTON.

St. Georges, Delaware, March 5, 1836

[NOTE.—The management which led to the extraordinary product of corn, should be deeply impressed upon the mind of every corn grower. 1, The ground was *well* dunged with *long* manure; 2, it was planted on a *grass ley*, with one *deep* ploughing; 3, it was well *pulverized* with the harrow; 4, the plough was not used in the after culture, nor the corn hilled, but the cultivator only used; 5, the sod was not disturbed, nor the manure turned to the surface; and 6, the corn was *cut at the ground*, when it was fit to top. These are the points which we have repeatedly urged in treating of the culture of this crop; and their correctness is put beyond question by this notable result. The value of lime and marl are well illustrated in the second experiment.—CONDUCTOR OF THE CULTIVATOR.]

From the Veterinarian.

NEW FACTS IN PROOF OF THE ADVANTAGE OF SPAYING MILCH COWS.

BY M. REGERE, M. V., BORDEAUX.

Several instances have been related in your journal of the good effect resulting from the spaying of mich cows. I would beg leave to add some cases which have come under my own observation. The cows were taken from the best dairies, but for obvious reasons, I selected those that had met with some accident at the time of calving.

CASE I.

A large cow, fifteen years old, had calved on the 24th of January, 1834, and had, a few days after parturition, given from three to four gallons of milk per day. On the 22d of April following, she yielded only two or two and a half gallons. I then operated upon her. The pain of the operation, and the restricted diet to which she was afterwards subjected, diminished the produce to half that quantity.

As soon as the consequent inflamation had disappeard, and the cow returned to her usual food, the flow of milk rapidly increased; and, in fifteen days after the operation, the wound having healed, she yielded daily from two to two and a half gallons, and that quantity has not since diminished. She has also taken on a disposition to fatten, and is in better condition than she ever was before. She has once shown a desire for the bull, but was not sent to him.

CASE II.

A small cow, six years old, calved on the 26th of March, 1834, and at that time, yielded two gallons and a half of milk per day. On the 30th of April she gave two gallons, and she was then spayed. She suffered little from the operation; her milk did not diminish, and she yields the same quantity to the present day. She has not shown any longing for the bull.

CASE III.

A littte cow calved on the 12th of April, 1834. Some days afterwards she yielded two gallons of milk per day, and she was operated upon on the 13th of May. She seemed, for a considerable time afterwards, to be in a poor state of health; her skin became yellow; the hair fell off in patches, and particularly about her four quarters. She moaned sadly from time to time, and her appetite considerably diminished. The quantity of milk remained the same.

On June 20th she seemed to be really ill, and yielded, during seven days, little more than a gallon of milk per day. The quantity gradually lessened after that period, and continued to decrease until the end of July, when she was evidently dropsical.—She was sometimes better and sometimes worse, until the 4th of September, when she died.

Two pounds of bloody scrosity were found in the throax. The lungs contained numerous tubercles; some hard, and some even stony, and some soft, and others filled with purulent matter.

On opening the belly it contained at least seven gallons of a similar fluid. The fourth stomach and some of the intestines were found softened and black, and the food contained in the stomachs was fetid. The liver, enlarged and yellow, was softened, and it it also contained many tubercles, hard or soft.

The womb was unaffected, except the extremeties of the two cornua, which were of a yellow color, and hard. Few traces of the operation of spaying remained, unless in the sublumbar region, in which a spot of blackish color was seen where each ovary had existed. A white tenacious tissue had united the incision made through the abdominal muscles, and caused the parieties of the abdomen to adhere strongly to the skin.

This examination after death, proved that the cow was not lost from any morbid consequence of spaying, but from ascites, produced by the lesions stated, and which had existed before the operation.

CASES IV AND V.

Two cows were operated upon in the month of May, of the same year. One, 8 years old and giving two gallons of milk per day, and that had calved on the 10th of April, was spayed on the 8th of May.—She suffered from the operation, and did not give more than two or three quarts per day; but she soon recovered, and when the wound was healed, yielded her usual quantity, and which she continues to do unto the present period.

The other, aged ten years, and that had calved on the 15th of April, and gave, a month afterwards, nine quarts of milk per day, was spayed on the 15th of May. In four days after the operation she gaveagain her usual quantity of milk; this increased to 10 quarts, and she yields that unto the present day.

These cows showed a disposition for, and went to the bull several times after the operation; and, being incapable of conceiving, the œstrum (or heat) returns on them periodically. The first has been with the bull four times, and the other twice.

These five cows have cotninued to yield the same quantity of milk which they gave at the time at which they were spayed; and this, on a fair calculation of the usual gradual diminution of the secretion, is double the amount that would otherwise have been obtained in the whole period. We must not yet go farther than this, but if cows that have been spayed should continue to yield such an extra quantity of milk as long as they live, the operation will be valuable indeed.

From the New-England Farmer.

A NEW KIND OF PUMPKIN.

We have been favored with a letter from the Hon. ABBOTT LAWRENCE, Member of Congress, enclosing some *Pumpkin Seeds*, which promise fair to be the means of introducing in this part of the Union a new and valuable article of culture. The seeds were presented to Mr. Lawrence, by the Hon. Mr. Kennon, M. C. from Penn., together with a note, of which the following is a copy:—

"My Dear Sir,—I hand you for some of your Eastern friends, a few seeds of the seven years' pumpkin, raised in our county. Its principal valuable property is the great time it may be kept in a state of preservation.

"My correspondent says, one of his neighbors has one which was pulled three years since, and that it now is as sound as it was the day it was taken from the vine. It is said it may be preserved for seven years. Yours, very respectfully,

TH. M. J. KENNON.

House of Representatives, April 14, 1836."

From the London Mechanics' Magazine.

SELECT COMMITTEE OF THE HOUSE OF COMMONS ON ARTS AND MANUFACTURES.

(Continued from page 185.)

MINUTES OF EVIDENCE.

George Foggo, Esq., Historical Painter, examined:

I have been repeatedly employed to design for the application of my art to bronze and silver. That manufacture now in England is exceeding depressed; principally, I should suppose, in consequence of the want of copyrigh, on which account the French have very greatly surpassed us.—In England at the present moment the uncertainty of recovering in cases of piracy, and the great expense attending a lawsuit, make it almost impossible for any but men of great capital to undertake such works at all. When they are undertaken, as the sale is exceedingly limited, those articles are almost universally converted into silver. In France, in consequence of the cheaper law and the greater facility of recovery, a much greater proportion of works of that nature are cast in bronze. So doubtful is the recovery, and so great the expense attending it, that where otherwise 50 guineas would be expended on a design, not more than 5*l.* would now be ventured by the silversmith. As, for instance, in one case where the amount to be expended on a piece of plate was 800*l.* I received 8 guineas for the design. In other cases, where the finished work would amount to 200 or 300 guineas, the utmost the silversmith could spend upon the design has been less than 5*l.* If the copyright could enable the undertaker of such works to spread them to the amount of 20 or 30, he could then afford tbn times more on the design, employing none but the best artists, and rewarding them liberally. The main advantage of the copyright in France depends on the circumstance of the cheap law. I was lately in court in a case where the sale of spurious works was most clearly proved. The expenses, I was informed amounted to 100*l.*, and the award for the sale of five different and distinct prints was 15*l.* From what I recollect of such cases in Paris, I should say that the expense would have been under 15*l.*, and the award might have been 100*l.* It is, therefore, in France worth while (particularly when we consider the certainty of recovery) for a man of talent to claim his protection; it would not be so in London. Bronze and silver are the same kind of manufacture, I should say: in most instances, bronze is first cast for the sake of the silver plate; that was the case with the celebrated Achilles' shield, by Flaxman. The original shield in bronze, most elaborately and beautifully finished, could not have been sold for much less, if any thing less, than the silver-gilt. But the taste is so much in favor of the more costly metal, that no one would give 3,000 guineas for the bronze, when they could get the silver-gilt for 4,000 guineas, although the value of the silver be not above 250*l.*; and I should say decidedly the bronze was most valuable; and I apprehend the taste of the public in that respect is deficient, inasmuch as gold and silver, having what I should term a positive color, are less applicable to the works of art than bronze, and still more particularly marble. In bronze it is more a work of casting. In fine works it is afterwards wrought up with great nicesty by the chisseller; in the above case Mr. Pitts, a very celebrated artist, was employed for that purpose. With respect to the mode of protecting inventions and designs in bronze, I think it, if it were worth the while of a man of talent to claim his protection, it would be fast carried out, according to our habits, by special juries, but under the present system this is much too expensive. By special jury, I mean a board of persons conversant with art, but subject, like our juries, to a challenge. Something like a *cour de prud' hommes*, or a board of competent arbitration, but doubt whether it would be right for them all to be artists. I also think that the period of the duration of copyright should be in proportion to the talent displayed, and the importance of the object. Some cases might not deserve three months protection, others would require 50 years. Some things deserve also to be better protected than others, in consequence of the great facility of copying them. All works that can be cast in plaster particularly require protection; for that which has cost the labor of months or years, and vast expense, may be re-produced by the plagiarist in a few hours. Such circumstances prevent the application of first-rate talent to any such productions. In a great measure the protection should depend on the talent of the artist. I consider that it would be for the interest of the public, for instance in a very beautiful work, that such a board or special jury should have the power of proposing, on the part of the public, to the artist, that his design should be bought up; but I have a very strong objection to the consideration of the interest of the public being paramount.—The circumstance of the Americans giving to their citizens an exclusive privilege of copyright, takes away all energy and exertion of those citizens. It has become scarcely worth while for an American to produce a work of talent, when the bookseller can get them from abroad for the price of a single copy. The French are superior to us in the accuracy of the execution of their work, but not equal in fancy and imagina-

tion; I have myself been employed to design for a work that has been sent over to France to be executed, and the execution was exceedingly correct. I should speak rather in favor of their execution and knowledge than their taste; for works in metal we still prefer that of the early period of Louis XIV. as more free and effective. I attribute the superiority of the French in correctness of drawing to the various schools of design established in every principal town, but more particularly in Paris; there schools are so various, that I do not think that any but a resident in Paris can fully understand the relative difference; they consist of the Royal Academy and the Government school of drawing; of private schools under an eminent artist, and of subscription academies, with no other than mutual instruction. Having resided seventeen years in that capital, and studied in one of their best schools, and at the Royal Academy, for eight or nine years, I am decidedly of opinion that private schools, under the most eminent masters, are greatly superior to any public establishments. The private schools are the original system of the instruction in France, as they were in Italy during its greatness. These schools are generally intended for the higher branches of art; but persons who do not evince talent of a high order, naturally fall into the employment of manufacturers. There is one school in Paris for the instruction of artisans employed by manufacturers. Each department has also something like a school of that kind; I am afraid it will be found they produce very little of that which may really be called talent. The national course of instruction for artists in France is very superior to the usual means in England; it consists of private schools, which system bears the most national character of any.—Every man of talent, as an artist in France, is supposed to owe much of his reputation to the pupils he produces; his object is to produce men of superior abilities, but the school gets popular, and the system is so well understood, that the number of students becomes very great, and from their superiority they are, when interest does not interfere, appointed teachers in the Government schools, and give a general tone to the talent of the country as far as circumstances admit. The Government schools are very inferior to the others in utility. The private establishments have the spirit of the country in them much more than the Government schools, for the Government schools are founded on one system, and, with one or two exceptions, all follow the same course; they do not fall into the wants of the times and the people so much as the private establishments. I do not mean that they are in name national schools, but they are the schools that give a national character to the French artists; which character is materially checked by the control of Government administration. In France, Government interference in positive instruction is injurious. The encouragement given to art in France is principally from the liberality of exhibitions, and most particularly of the libraries and the museums. The opportunities of study in the libraries and museums are far superior to any thing in this country. I may mention, in proof thereof, that the works of Flaxman, of Mr. Hope, and the publications on Etruscan vases of Sir William Hamilton, were shut up in private collections in England, and produced little effect on the public taste; but being placed in the libraries in Paris and other towns, where not only artists, but the public, had free access, the knowledge and taste of Flaxman and Hope became there generally appreciated, instead of being, as in England, confined to a few. A fine example of their museums was that of the French monuments, where, in appropriate halls, samples of French statuary of seven successive centuries, afforded an excellent opportunity of studying the taste and the history of the nation. That of mechanical machines is also of great utility. Museums, I apprehend, must be the permanent and all-important sources of taste. Public lectures on the great principles of design and taste may be advantageously added thereto; and from the necessity of the case, another country being so greatly in advance of us in those branches, schools for the instruction of mere outline, and still more of the rules of perspective, would produce very great and beneficial effect. I certainly do think that much advantage would be derived from instruction in the proper simple rules, without shackling the taste; but it appears to me that good taste is so essential to the interests of the community, that museums should be provided at the national expense; but practical skill being an advantage of a more individual nature, ought rather to be paid for (moderately) by the individual. The general taste is decidedly higher in France than in England; but superior taste and imagination more frequent in England. I account for the distinction from this circumstance: I think the arrangements of Louis XIV. and Colbert have placed such fetters on imagination, that the utmost that instruction can do in France is to inculcate fixed principles and precision of execution. In the fourth year of the republic, under the Convention, schools of various kinds were instituted. Exhibitions and prizes were also decreed on a liberal scale, but they were ultimately counteracted by the re-establishment of the Academy, similar to Louis XIV., and the occasional injudicious interference of the Emperor. There has been no alteration in the Academy of Arts from 1800 till the present moment, except the exclusion of foreigners from the prizes, and a few minor bye-laws. I conceive that the fixed principles and correctness of execution are all that can be properly conveyed of instruction to an artist. They are all that can be wished for when competition is encouraged; and without free competition art is stifled, therefore it is absolutely essential. With regard to the departmental schools, if the appointments of professors were popular they might do a deal of good; but when I have seen an old man of 62 or 63 appointed to one of those schools, not for the good of his pupils, but to save him from starving, I cannot expect much good therefrom; when I have known, in the principal school for the mechanics of Paris, a man of the highest talent, M. Peyron, after 25 or 30 years' exertions in the under professorship, superseded in his claim to the higher professorship by a friend of the Minister, I find a total want of that principle which free competition and proper elections would have carried out. The reason I think superior taste and imagination more in England, is on account of the restriction in France, where, being under the Minister of the Interior, all follow one system and routine. In England, competition is created by commerce, which frequently brings a man from the humbler branches of manufacture to the highest stage of art, such as Martin, Muss, Bone, Bacon, and Banks. In fact, the French attempt to teach that which is probably not within the strict limits of teaching, and interfere a great deal too much. The positive, the undeniable, fixed, and positive rules of art, such, for instance, as perspective, anatomy, proportion, and perhaps botany, and those things which connect arts with manufactures, in which the principles are undeniable, should, of course, be taught. I think it almost as necessary for a people to possess a knowledge of those points, as to know how to write; I consider it a second way of reading all the beauties and merits of nature. The deficiencies, both in England and France, which still exist, are, first, the deficiency of correctness of perspective, even where correctness of outline is otherwise generally attained; perspective is often little understood in other countries, but is particularly neglected in England. Secondly, a very imperfect knowledge of the history of the arts and of commerce, their effects on each other, and on the state of nations, and thence false theories. The relative influence of the taste of Paris and London is this: the taste of Paris spreads all over France almost like lightning, while that of London is very much counteracted by the different habits and influences of our commercial towns: for this very reason, museums exactly similar might be established in France without any material injury; but museums in England would be best under the direction of a general board, but modified by the management of men capable of applying them to local purposes. If the town of Liverpool had a museum, it certainly would not, if left to the management of a local board, be similar to a museum in Birmingham or Sheffield, and it would be right that they should not be similar. A knowledge of mineralogy might be exceedingly useful in one town, and perfectly useless in another. Objects of general utility, of general taste, such as fine representations of the most beautiful pieces of sculpture, objects of taste, such as vases and ornamental designs in general, might be exceedingly useful in them all, but each would superadd what was of local interest in proportion to its connexion with different countries, and the manufactures on which it depended.—A local administration should be under a general control, or the control of a general board, in order to prevent local interests from holding too great an influence in the elections, and contracted views in the management; for I am greatly mistaken if,

under a well controlled representative system, the arts are not capable of disseminating knowledge in fifty ways that have never yet been attempted, and I am also strongly impressed with the notion that they should tend to a general improvement of the morals of the people as well as of their intellect. I have no doubt that, under a proper general board with local management, they would be highly capable of both. Some of our manufactures far excel others in the merit of the designs, and this is usually in proportion to the difficulty of copying them, as the injury of a deficient copyright is therein less felt. I should instance, particularly, the japan manufacture, where the designs are more exquisite than any thing produced abroad. The excellence of a design is partly to be attributed to the difficulty of copying, inasmuch as it is an impediment to the plagiarist, and consequently a protection to the original designer. In the case of the japan manufacture, in consequence of the difficulty of the manual operation itself, the thing is better protected, and I ascribe it partly to the system of encouragement and competition established in the manufactures themselves; the works in japan are, however, conspicuously defective in perspective. I mention this to show, that of all the branches that ought to be taught, that of perspective is one of the first, inasmuch as it is not readily to be obtained. Each manufacturer in the japan trade has his own designers and painters. Designing is not a trade by itself, by which persons get their livelihood, that is, to furnish patterns to the manufacturers of designs in paint, not at least in Birmingham; what there may be in London I am not acquainted with. In that particular line the designs are very superior, but there are inaccuracies from want of instruction. At some interval of time and distance I examined the French and English japan works repeatedly, but not lately; there are no French ones that can at all compare with ours. The French shun the competition, though many individuals in France are anxious to introduce our japan articles in France at present. We have the advantage in both material and design; we are not equal in execution to the Asiatics, but superior in design. Mechanics' Institutions would be so far more beneficial than any school of design, that they would convey to pupils knowledge in chemistry or mechanics or design, according to their natural genius. They would do exceedingly well if you could manage the election of the professors; but in that case a member of an Instituiton is more likely to be elected than one not a member; it is therefore local talent which gets the influence, which is not so good as a person confirmed by the approbation of a general board. If the Institutions would agree to be subjected to the decision of a board in London, that much good might be effected. The advantage Mechanics' Institutions would derive from the parent Institution is, they would collect a variety of models, which they cannot now obtain.—Therefore, in this country, where you have three or four branches of trade carried on, in Manchester, and in some places almost every branch of trade, you would not confine it to a school of design only, but make it one branch of what would be a drawing class; those who have a taste for chemistry would be good preparers for the materials of printing, and so you would make it useful.—Another way might also be easily accomplished, by placing museums under the direction of men capable of communicating instruction.

Samuel Wiley examined:

I belong to the firm of Jennings and Batteridge, of Birmingham, by whom there have been great improvements made in the japan trade of late years; being men of taste, and stimulating their apprentices and teaching them the art of drawing; they have taken great pains. Our men have inserted works of art in the Birmingham Exhibition, and other places. Our trade might be increased by improving the public taste; the public taste is bad; I could sell them the worst things, the mot unmeaning, in preference to the most splendid designs and the best executions. I could frequently sell bad articles, bad in execution and design, for the same money as I could sell the best. The Chinese adhere to but one style of work exclusively, and that most beautiful in point of execution, but unmeaning as it regards design and perspective; in fact, the designs are very bad. The materials they use I consider one great means of their goods looking so much better than ours; the material they use. Their material after it is laid on, whether it is gold or gold powder, is never varnished, and there is a degree of brilliancy and richness that never appears after it is varnished; we are obliged to varnish ours to preserve its colors, in doing which we lose a great part of its brilliancy. Some years ago we procured gold powder from China, and could make it appear of the same appearance as that from Canton, and we found it very valuable indeed for the purpose of imitating the Indian cabinets, and the various articles we have to copy or to repair; but there is a different appearance, as different as possibly can be, between the Indian gold and gold powder, and that of British manufacture; and the material they use for laying on the gold is different; we are informed it is a gum extracted from trees, and when the parts are laid on they are the very same as though you cut small gold wires and laid them in, there is that prominence. There is no trade in this gold powder; we only got it from one person. Accidentally we met with a party who had been an Indian merchant; we found it much cheaper than ours; Mr. Jennings was about making a journey to Canton to procure some himself. I believe the Chinese prohibit the exportation of it from China. I do not know whether the importation is prohibited here; we have applied to various merchants for it; whether it is an article that never comes under their observation we do not know. We have not had it analysed; I think it is prepared by a chemical process, and I think also that it is from the compound that it is better; very likely the metal with which they mix their gold is of a finer quality than ours. The Chinese have a great advantage in their gums. We pay the workmen from 15*s.* to two guineas; in some few exceptions we pay from three to four guineas and a half; one we pay four guineas and a half—the only one; every workman designs his own pattern. A good designer is well encouraged; he is the most valuable man. The French prefer our articles, because they are much better in material, workmanship, and design, in characters, beauty, and every thing. They do not seem to raise the japan trade to an art; they appear merely to daub it over, and call it japan; there is neither design nor beauty of execution in French work. It is indispensably necessary for a person who designs to be acquainted with the manufacturing branch of the business. Our workmen generally come at twelve or fourteen years of age; if they have previously been taught drawing with perspective, it is a sort of tuition in the other branches; drawing and perspective are essential for them to be taught this afterwards. We teach them first of all drawing and designing, and then manufacturing. The first branch may be learned in London, or elsewhere, and the rest in Birmingham.

M. Claude Guillotte examined:

I am a maker of jacquard looms, and of all sorts of looms for silk manufacture, and of French bar-looms, by Premaillerre, upon which (the bar looms) from ten to thirty ribbons at a time may be manufactured, and the whole of the machinery conducted by a young man. Of those, I manufactured 150, at several times, and for several parties; and they were the very first ever introduced to this country, and for which machinery I took out a patent. Jacquard machinery adapts itself to all sorts of tissue. I made three years ago, the most complicated machines ever produced in England, with 4,600 threads, at a cost of 50*l.*, and before it was put in order and set to use, it cost 100*l.*; it was for weaving napkins and table-cloths, which was all worked by one man. I also made many of the jacquard machines, with 1,600 to 1,700 threads, for smaller table linen. Of late, I am making jacquard machines, by hundreds, for all parts of England, where they had not been introduced before. For Yorkshire, I am particularly engaged at present, making them for merinos and damasks, and the same for Bolton and Manchester; I have agents in Manchester, and Bolton district; and I have been engaged in making them at Coventry for ribbon. There are from 7,000 to 8,000 jacquard looms in operation in the country, and there has been an extraordinary increase in the demand for the silk manufacture, I received in London orders for six, eight, and ten at a time; in Yorkshire, I receive orders for from sixty to eighty at a time; and for worsted manufactures, the demand is also considerable. The demand commenced about eleven years ago, and has become much more active of late in Yorkshire: and yet, I was four years ago in Yorkshire, at Halifax, Huddersfield, and the surrounding country, with an interpreter, taking with me half a dozen, and there was no individual willing to purchase one; and

after my return, I received an order for one machine, in order to make an experiment; it succeeded, and the consequence was, an order from the same individual, a Mr. Gill, to manufacture more than a hundred such machines, and there was a demand at any price from every body. These were to replace the old mechanism, which was employed in producing small patterns; those are principally used for waistcoats. The demand could not of course continue so great as it was; but there is still a demand, principally for merinos and damasks. In Scotland I have an agent, but I do not do much, the price of the cards for the manufacture of Scotch shawls being too high. The difficulty of applying these cards to shawl-making is, that for the production of the beautiful pattern, 5,000 or 6,000 are required, which makes it too expensive a machinery. At Norwich, a good many were sold one or two years ago, but they are expensive, and it has prevented its being much applied to the silk manufacture. In Scotland, they use a draw-boy instead of a jacquard to make the figure, to draw the threads that produce the figure on the cloth: in Scotland and Norwich, the number of cards which are necessary for the production of a figure, make the employment of jacquard machines much more expensive. Sometimes I employ foreign workmen in the manufacture of my machines, but they leave me when they can better their condition; and a good workman, such as I can employ, will get thirty shillings a week. I think the price is cheaper here than it is in France, and I acconnt for it thus: because I carry on the whole of the manufacture in my own workshops; while in France the production of a jacquard machine is divided among the workshops of several persons. There are only two principal makers here, but the competition between those two is so great that the prices are kept low. Many inexperienced persons have made attempts to make the machines, but have not been able to compete with those who had more experience, and they have failed in producing the article as cheaply as we. I employ about from thirty-eight to forty workmen, all in London. The operation of adapting the design to the loom is this:—First, the design or pattern to be made on the cloth is drawn on paper, and produced for approbation; it exhibits on paper what it is intended to be on the cloth; as the threads are very minute they are then as it were extended on another paper, the rule-paper, of a larger size, which shows the pattern as it were magnified, so as to place so many threads to the inch, perhaps twenty, so that every square represents a thread. This is what the French call *mise en carte*, and in English, put upon rule-paper. The next process the rule-paper undergoes is, to be read in, which transfers the pattern from the rule-paper, and prepares it fully for the stamping of the cards. The rest of the process is mechanical, consisting of punching holes in the cards, according to the number required, and applying the card to the machine. In this mechanical operation I have seen 200 boys employed in weaving the richest figures in the loom. To so simple a principle is the process of weaving now reduced, that even boys of sixteen are set to weave the figures of so complicated a nature, as formerly would have required men of twenty or thirty years' experience. In some departments of this process, the manufacture is superior in England; in others in France. Plain silks, if manufactured with the same materials, the production will be equal in England as in France; figured silks are equal, as respects the mere manufacture; and there are two points of inferiority, the designing and the *mise en carte*—put in rule-paper. One particular reason for inferiority in England, which has much struck me, is, the very costly price of cards. In the woollen manufacture, the cards which have been used for woollen goods have, as I have observed, been returned to the Excise. A return of duty has been obtained. I think that, if the same thing were done with the jacquard cards, it would have a tendency to diminish the price. Though generally speaking the price is about equal in the two countries; yet in the reading the designs there is this enormous difference; the average price in France is three francs, or half a crown sterling; in England, the price was a long time 15*s.*; it came down to 10*s.*, and I now charge 8*s.* per hundred. I attribute that to two causes, the presence of silk manufacturers, which has created a greater competition, and a greater necessity for activity. This activity commenced in 1823, but since 1826 the activity and competition were very greatly increased. The consequence of this competition has been also the introduction of a great many French dyers to settle here. The French designer understands the *mise en carte* (putting on rule-paper) better than the English designer; and the French *metteur en carte*, understands design better than the English *metteur en carte*. The great reason that occasions this great difference between the *metteurs en cartes* and designers of England and France, is, that the designers themselves are obliged to put it on the rule-paper, and previous to that, go through every branch of the business, (including the weaving,) and this is undoubtedly the cause that they are more perfect. I do not mean to say that they design better in France than here; but there is a much greater number of designers of the same capabilities in France than here. In consequence of the encouragement the French designers receive, they are as well more numerous as more talented in their science, in common; although there are individuals in England equally as clever, and with a profound knowledge of their art. The artist who draws the designs at Lyons, is the artist generally employed to transfer it to the lined paper. This person, whom I consider the *metteur en carte*, is only employed in that; he is inferior here. In Lyons, in a great number of instances, there is never a design drawn at all; but the first production of the design is on the lined paper. The *metteur en carte* is himself an artist. It is in the connexion between the arts and the manufactures that we are inferior. In France a manufacturer employs from three to four artists, and in England one artist supplies eight to ten manufacturers. An indifferent artist employed in painting the patterns on the ruled paper may be obtained for 50*l.* a-year, but there are men whose services are worth from 400*l.* a-year, or even a share of the manufacture. The sale of the fancy trade entirely depends upon the taste and abilities of the designer. In France there are often only one or two artists who are paid, and largely paid, who get from 180*l.* to 200*l.* a-year, but there are several who give their services for the instruction they receive. The *metteur en carte* ought to be well instructed in designing. He ought to be also well acquainted with manufactures in theory and in principle. They are so at Lyons, but they are not so in this country. The jacquard loom was first adopted at Lyons after the Revolution. Before the invention of the jacquard machine, eight or ten years were required to make a good workman; afterwards six months were sufficient. For ten years after the discovery, the machinery remained with very little influence, but designers increased with the introduction of the machine. From 1808 to 1810, the machine was brought into activity, but at that period it was very imperfect. In 1814 it was much improved, and in 1815 it was fairly established. When France possessed the monopoly of the jacquard machine, it gave her great advantage in other countries; but since it has been introduced into many other countries, France has only by great exertions produced better and cheaper than they. There is a school of design at Lyons. The young artists have, since the discovery of the jacquard particularly, turned their attention to the *mise en carte*. There has been every augmentation of such young artists; indeed, there were no such artists before; for it was found requisite to set up jacquard machines in the school of design. This lasted two or three years only, as they now obtain the required knowledge of the loom out of the school. The discovery of the jacquard loom infinitely multiplied the number of young artists, who devoted themselves to the *mise en carte*. The great advantage of jacquard machinery is this, that it enables that to be done in a few weeks, which before occupied months; and that the change of a pattern formerly was a long, laborious, and costly affair, and now it is a very simple one, and may be done in a few minutes after the completion of the reading and the stamping of the cards. In France, in ordinary cases, our artists receive six months' instruction in the theory of the manufacture, before they are called into the field of practice, after they have been instructed in the school of design at Lyons; or artists, during their instruction, must pass two hours a day to understand the theory of the application of the design relative to the machine. There are private instructors who give those lessons in the school of design at Lyons; they also give instructions in the *mise en carte*, making their talent practical. The English copy the good French, and the French copy the good English. The best English designs

are those in cotton goods; but the English do not understand the *mise en carte*. We sometimes make good copies from English patterns for the Spitalfield looms from the English printed muslins, but it requires taste and knowledge to arrange them. The French manufacturer can come with patterns every year to England, bringing with him patterns on the material; not only designs on paper, but on the material; whilst the English manufacturer only brings it on the paper; the cause of that is, the French manufacturer employs weavers who are solely engaged in the production of patterns, and as the pattern on the tissue cloth shows more distinctly the effect than the drawing on paper, it gives them an advantage in the market. There are individuals who are engaged, and who collect at Paris the patterns in vogue there, which they bring and dispose of in England, and they also carry to the continent such patterns as they can collect here for the purpose of sale. These only serve as mere ideas; in the execution of the working drawings the French improve upon us. If there were a school of design established in London, its effects in three years would be so to equalize the manufactures of the two countries, so that the country in which they were produced would not be recognisable. Jacquard machinery is applicable to every fabric figured or flowered, every thing that can be woven; to every species of tissue to which a loom can be applied, even to straw hats, horsehair and wire, and every other species of web. The principal difficulties in the way of improvement in the silk manufacture are, first, the high duty on paper. The high price of paper has this injurious effect, that the manufacturer is very unwilling to change his patterns. There is a difference between the cost in France and England; it is as one to four. The English card is superior to the French; but that makes little difference, because it is never worn out, a new pattern being always introduced before the cards are worn. The two disadvantages I consider are these, the higher price of the cards, and the inferiority of the *metteur en carte*. With respect to colors, I think, in a great many cases, where there is an apparently greater beauty in the French dyes, they are much less permanent than those of England, and I have seen many examples where, after a few weeks' wearing, the French colors have wholly faded.

"I take the liberty of making the following few remarks about designing and *mise en carte*; for as this is the very head part of all that belongs to the weaving department, and, at the same time, is the very least cultivated in this country, it is before any thing else the most worthy of your attention and consideration. For as long as this part of the manufactory is not highly improved, and proper schools for design and *mise en carte* erected, and children, who alreadyhave acquired the practical and theoretical part of weaving, are engaged and trained up in this art, France will always have to boast over England of the honor of sending more fancy patterns, and finer and more beautiful workmanship, and, in fact, brought to the highest perfection. But, on the contrary, if it should meet with your Honorable Committee's approbation, and get the least encouragement to bring it into fulfilment, and to get such schools erected in some quarter of Spitalfields, or its arrondtssement, there is no doubt whatever in a very short time the English manufactures will soon rival, if not altogether equal, the French manufacture, and thus throw off the shame of seeing foreign manufactures surpass the English in quality and superior workmanship.

"Your very humble servant,
CLAUDE GUILLOTTE."

Mr. John Henning. examined:

Have you been in the habit of executing works in relief for a considerable time?—Yes.

You executed the frieze on the corner over the gate-way at Hyde Park Corner, and the frieze on the Atheæum?—Yes, in conjunction with my son John, who had contracted with Mr. Burton to do that work in 1827, which was followed by the frieze of the Athenæum, which was a selection from the sculptures of the Parthenon. On both friezes the design was drawn upon the stone, and cut without the usual process of pointing. These were our first works of the kind in stone.—Previously I had been engaged principally in drawing and modelling, and our first work in intaglio was the sculptures of the Parthenon, which was begun in 1816, and finished in 1822.

Have you ever had occasion to consider the subject of a copyright?—Yes, I have; but I have only to tell the Committee of the difficulties which we modellers and sculptors experience; I do not feel that I dare presume to propose a remedy, though I may notice the evils which I have suffered.

State them as clearly as you can.—I have brought a specimen of the frieze of the Parthenon engraved on slate in intaglio; I have also brought a cast of this intaglio in plaster, and another, broken, in the way in which it appears now in the Museum; the intaglio is the matrix from which these casts have been taken; previous to engraving the intaglios, careful drawings were made from the mutilated marble, and the deficiencies were made good to see the effect, and then they were transferred to the slate in the opposite direction, that they might be right when cast.

You were going to state the difficulties which these specimens were to elucidate?—Yes, as soon as the casts are issued, whoever lays their hands on them may, with very little trouble, take moulds in sulphur, wax, or plaster, and multiply them to any number.

You consider that the law does not afford you protection?—There is no protection, as I understand, but in an action at law. The thing appeared so unmerciful to me, to lay hold of a poor man to raise an action against him, that I never could think of doing that. It struck me that if there was any thing like a committee of art in London that could be appealed to, to identify where a spoliation or theft of this kind had taken place, it might be much cheaper than law.

A species of arbitration committee?—Yes; for any gentleman who knew any thing about it, could detect those thefts readily.

Have you ever thought of the subject of registering such works?—I always have understood by the law, that if you put your name and date it was sufficient, but I think such property as much my own as my clothing, and no one has any more right to appropriate it than to claim my personal labor without remuneration. The originals exist in the museum, open to all who may desire to make studies from them, without condition, but compliance with the economical arrangement of that institution. This would be fair and honorable strife who could do best; but what hand or heart can contend with the covetous and unjust, who, by the cunning labor of a few days can contrive to rob me of years of life, and scatter over the whole land the deteriorated casts of my works, much to my prejudice as an artist?

All you want is a cheap tribunal?—That is the very thing wanted.

Have you suffered from your own works being infringed upon?—Yes, very much, indeed.

Can you give any remarkable instance?—I had, within the last six months; a man without giving me his address, wrote to me twice, and put me to the trouble of writing to him; at last I got a third letter, giving particular orders to make them ready. I took it to be some gentleman; at last I found after I had packed them up by a given day, I found that he had gone to a person who was in the habit of furnishing people with them, and he never came near me. Nothing would do in that case but an action at law, therefore I preferred rather putting up with the loss.

You submitted silently to the inconvenience rather than encounter another?—I cannot blame any body for that but myself.

Then he pirated your works in this case?—No, I could not call this piracy, but rather resetting, for he went to the pirate who served him with my stolen goods; but many have pirated them, and continue to do so.

You felt you could only have recourse to an action at law?—I never understood that I had any other recourse than that.

Why had you not?—Because of the expense, and I could not think in my heart of prosecuting a person probably without a shirt, who perhaps did it from poverty; I could not proceed against him.

You are a self-taught artist?—I do not know what to answer to this question; however, I have not had any thing like what might be called regular instruction in art. In art, as in every profession, the master, in many cases, can only be considered as the finger-post which points the road the pupil must go on to the place; the pilgrim, creeping or running, must exert himself to the end of his journey, otherwise he will never arrive there.

(To be continued.)

NEW FASHIONED PEA STICKS.

Being at our friend Dr. Holman's, of Gardiner, the other day, we noticed what to us was a new plan of manufacturing pea sticks. He had obtained a lot of small white birches, just cut, about from five to seven feet high, and full of branches. These he placed upon the ground, and put boards or slabs upon them, with any heavy substances which might be at hand to press them down flat. This operation spread them out like a *fan*. After being kept in this position for a week or two, or until they are wanted to stick the peas, they are taken up. The branches retain their fan-like position, and afford a fine support for the tendrils of the peas to lay hold of.

SOAP FROM FLINTS.

The following notice of a curious improvement in the manufacture of soap, is from the London Mechanics' Magazine. It will be perceived that the soap proposed is a mixture of common soap and sicate of potass or soda, sometimes called "soluble glass." The writer of the article is certainly mistaken when he speaks of the materials of the latter compound "attaining saporification."

We have strong doubts as to the detergent power of this compound. We must confess our fears, that the compound would be found rather "sticky" than otherwise. However, the experiment is a simple one and worth the trial. No one can have doubt as to the cheapness of such a soap.—Ed. Mech. Mag.

"Wonders will never cease. This Magazine has been the medium of communicating to the public many curious and useful inventions; but making soap from flints we little thought it would have fallen to our lot to mention on this side of the grave. Mr. J. C. C. Sheridan, a native of Belgium, is the inventor of the process, and has obtained for it patents in England, Scotland, and Ireland. It is very agreeable to us to be the first to describe to the public a process so likely to produce a total but highly beneficial revolution in the manufacture of soap. Mr. Sheridan takes the common black flint, calcined, and reduces it to powder by wet-grinding: then mixes it with the caustic soda leys, or potash leys, and boils it till it attains saporification. The mixture so obtained is added to the present soap materials after the latter have been boiled to that state when they have become soap, and are ready to be poured into the frames. The mixture, which has a highly detergent quality, requires to be well crutched along with the soap materials; and when thus crutched together, the result is a soap of excellent quality. The mixture becomes intimately incorporated with the soap materials, and may be added in the proportion of from 40 to 50 parts of the mixture to 50 of the soap materials. Thus the common silex, which is obtainable at a very low price, takes the place of tallow, not purchasable under 40*l.* per ton, to the extent of nearly one-half. This invention, which promises to come into very general use, will have the effect of diminishing the consumption of tallow, and conseqently rendering us, in the production of a staple commodity of the utmost importance to the health and commerce, independent of the great northern Autotocrat.

The following report will be found interesting to many of our readers—and therefore we give it entire, with the proposed new organization of the department:—

THE SELECT COMMITTEE APPOINTED TO TAKE INTO CONSIDERATION THE STATE AND CONDITION OF THE PATENT OFFICE, AND THE LAWS RELATING TO THE ISSUING OF PATENTS FOR NEW AND USEFUL INVENTIONS AND DISCOVERIES, SUBMIT THE FOLLOWING REPORT:

The promotion of the arts and the improvement of manufactures, are the objects aimed at in granting patents for inventions. All civilized nations have provided in some form for the encouragement of inventive genius. England, from whom we derived, originally, most of our notions of national polity, and who has hitherto been considered the "queen of arts," is in no small degree indebted for the distinction, to the liberality with which she has always rewarded genius and science for their inventions and discoveries. Individual munificence and the patronage of wealthy associations, have there, as in France and Germany, done much to supply whatever was wanting in the liberality of the Government. But such patronage is necessarily partial in its operation. It is limited to particular objects, if not to particular individuals. There appears to be no better way of measuring out appropriate rewards for useful inventions, than, by a general law, to secure to all descriptions of persons, without discrimination, the exclusive use and sale, for a given period, of the thing invented. In this way they will generally derive a just and appropriate encouragement proportioned to the value of their respective inventions. It is not at this day to be doubted that the evil of the temporary monopoly is greatly overbalanced by the good the community ultimately derives from its toleration.

The granting of exclusive privileges was in England originally assumed as a prerogative of the Crown, from which it derived a revenue. It was at first limited to the introduction of manufactures from other countries. Afterwards like privileges were granted for new inventions made within the realm. Like all other regal prerogatives, it was subject to abuse, and Parliament found it necessary to limit and restrain it. This was done by the famous statute of monopolies, passed in the reign of James I, which defined the King's prerogative in respect to the description of grants which might legally be made, and among them were patents for inventions and new manufactures. The very brief reservation of right in the Crown contained in that statute, and the judicial decisions in cases arising under the grants of privileges made pursuant to it, constituted the whole of the English law on the subject up to 1835, when a law was passed by Parliament giving the right to file a disclaimer in certain cases, and containing some other less material provisions.

It is from those judicial decisions that we have derived most of the principles on which our laws on the subject are founded, and which have entered into and influenced the judicial expositions given to them. But the decsions of our courts have been characterized by a more enlightened and liberal application of equitable principles to cases of this description, in a just endeavor to sustain patents for meritorious inventions, instead of seeking to find, in the technicalities of law, a pretext for setting them aside.

Prior to the adoption of the Federal constitution, the States, within their narrow limits, could give very little encouragement to inventors by grants of exclusive privileges; and up to that time the arts had made very little progress on this side of the Atlantic. By the constitution of the United States that power was wisely vested in Congress.

The first act of Congress on the subject was passed in 1790. It authorized the Secretary of State, Secretary of War and the Attorney General, or any two of them, on application, to grant patents for such new inventions and discoveries as they should deem "*sufficiently useful and important.*" Under that act the board so constituted exercised the power of refusing patents for want of novelty in the invention or of sufficient utility and importance.—This act extended the same privilege to aliens as to citizens. In 1793, it was repealed, and another act passed, authorizing patents to citizens of the United States only, to be granted by the Secretary of State, subject to the revision of the Attorney General. In 1800, the privilege to take out patents was extended to aliens who have resided two years in this country, and made oath of their intention of becoming citizens of the United States.

The act of 1793, which is still in force, gives, according to the practical construction it has received, no power to the Secretary to refuse a patent for want of either novelty or usefulness. The only inquiry is whether the terms and forms prescribed are complied with. The granting of patents, therefore, is but a ministerial duty. Every one who makes application is entitled to receive a patent by paying the duty required, and making his application and specification in conformity with the law. The necessary consequence is, that patents have, under the act of 1793, been daily granted, without regard to the question of novelty, or even utility in the ordinary sense; for it has been settled that the term useful, as used in this statute, is only in contradistinction to hurtful, injurious, or pernicious. This construction (that no right is conferred to refuse a patent) has been giv-

en to the law by the Department charged with the duty of granting patents, not so much probably from any necessary and unavoidable import of the terms of it, as from a disinclination to exercise a power of so much importance, in cases where it is not clearly and distinctly granted. And it may be reasonably doubted whether it was the intention of Congress to confer such a power on the Secretary of State alone, since no provision is made for an appeal or other remedy for an incorrect decision adverse to the applicant. Besides, any person occupying that station might be supposed as little qualified by an acquaintance with the appropriate branches of science or of the arts, to decide such questions, as any other officer of the Government. And were he to undertake the task of such an examination as would be necessary to a decision in each case, he would have little time for other official duties.

Under the act referred to, the Department of State has been going on for more than forty years, issuing patents on every application, without any examination into the merit or novelty of the invention. And the evils which necessarily result from the law as it now exists, must continue to increase and multiply daily, till Congress shall put a stop to them. Some of them are as follows:

1. A considerable portion of all the patents granted are worthless and void, as conflicting with, and infringing upon one another, or upon public rights not subject to patent privileges; arising either from a want of due attention to the specifications of claim, or from the ignorance of the patentees of the state of the arts and manufactures, and of the inventions made in other countries, or even in our own.

2. The country becomes flooded with patent monopolies, embarrassing to bona fide patentees, whose rights are thus invaded on all sides; and not less embarrassing to the community generally, in the use of even the most common machinery and long-known improvements in the arts and common manufactures of the country.

3. Out of this interference and collision of patents and privileges, a great number of lawsuits arise, which are daily increasing in an alarming degree, onerous to the courts, ruinous to the parties, and injurious to society.

4. It opens the door to frauds, which have already become extensive and serious. It is represented to the committee that it is not uncommon for persons to copy patented machines in the model-room; and, having made some slight immaterial alterations, they apply in the next room for patents. There being no power given to refuse them, patents are issued of course. Thus prepared, they go forth on a retailing expedition, selling out their patent rights for States, counties, and townships, to those who have no means at hand of detecting the imposition, and who find, when it is too late, that they have purchased what the vendors had no right to sell, and which they obtain thereby no right to use. This speculation in patent rights has become a regular business, and several hundred thousand dollars, it is estimated, are paid annually for void patents, many of which are thus fraudulently obtained.

In this collision and interference of patents, the original and meritorious inventor sees his invention, to the perfection of which he has devoted much time and expense, pirated from him, and he must forego the reward which the law was intended to secure to him in the exclusive right it grants; or he must become involved in numerous and expensive lawsuits in distant and various sections of the country, to protect and confirm his rights. If he be wise, he will generally avoid the latter, and submit to the former alternative of injustice, to which the Government, as the law now is, makes itself accessary. The practice is scarcely less reprehensible, of taking out patents for what has been long in public use, and what every one has therefore a right to use. The patentee in such cases being armed with the apparent authority of the Government, having the sanction of its highest officers the seal of state, scours the country, and by threats of prosecution, compels those who are found using the thing patented, to pay the patent price or commutation tribute. This exaction, unjust and iniquitous as it is, is usually submitted to.

The extent of the evils resulting from the unrestrained and promiscuous grants of privileges, may be imagined, when it is considered that there are now issued, since this year commenced, at the rate of more than a thousand a year; a considerable portion of which are doubtless void for want of originality in the inventions patented, either in whole or in some of the parts claimed as new.

A necessary consequence is, that patents even for new and meritorious inventions are so much depreciated in general estimation, that they are of but little value to the patentees, and the object of the patent laws, that of promoting the arts by encouragement, is in a great measure defeated.

To prevent these evils in future is the first and most desirable object of a revision and alteration of the existing laws on this subject. The most obvious, if not the only means of affecting it, appears to be to establish a check upon the granting of patents, allowing them to issue only for such inventions as are in fact new and entitled, by the merit of originality and utility, to be protected by law. The difficulty encountered in effecting this, is in determining what that check shall be; in whom the power to judge of inventions before granting a patent can safely be reposed, and how its exercise can be regulated and guarded, to prevent injustice through mistake of judgment or otherwise, by which honest and meritorious inventors might suffer wrong.

It is obvious that the power must, in the first instance, be exercised by the department charged with this branch of the public service. But as it may not be thought proper to intrust its final exercise to the department, it is deemed advisable to provide for an occasional tribunal to which an appeal may be taken. And as a further security against any possible injustice, it is thought proper to give the applicant in certain cases, where there may be an adverse party to contest his right, an opportunity to have the decision revised in a court of law.

The duty of examination and investigation necessary to a first decision at the Patent Office is an important one, and will call for the exercise and application of much scientific acquirement and knowleege of the existing state of the arts in all their branches, not only in our own, but in other countries. Such qualifications in the officers charged with the duty, will be the more necessary and desirable, because the information upon which a rejection is made at the office, will be available in the final decision. It becomes necessary, then, to give the Patent Office a new organization, and to secure to it a character altogether above a mere clerkship. The competency and efficiency of its officers should correspond with their responsibility, and with the nature and importance of the duties required of them. When the existing organization was adopted, the granting of patents was a matter of little importance, compared with with what it now is. The arts in this country were but little understood, and but little cultivated. Agriculture and commerce constituted our principal business. We had few manufactures, except those of a domestic character, adapted to ordinary domestic wants. Our work-shops were in Europe. Enterprise, in this country, ran in other channels. The war of 1812 gave it a new direction, and a new impulse, by creating an occasion for work-shops of our own. Necessity became the mother of invention, and American manufactures sprang into existence as by enchantment. Their rise and progress may be dated from that period; and a more rapid advancement in the arts, and a more astonishing development of human ingenuity, have never taken place in any other age or country. This remark will appear far from extravagant to every one who will take the trouble to examine the subject. This awakening of dormant genius to a practical and active existence, next to the arousing of the political and patriotic energies of the Union, was one of the great results of that contest.—It opened to the country a new era. The nation entered upon a new existence. And since that period, American industry and enteprise, guided by American ingenuity and intellect, have achieved what would have taken Europe a century to accomplish. She has become all at once a manufacturing, as well as an agricultural and commercial nation. The useful arts have been cultivated with a success before unexampled, and have contribnted, in no small degree, to the wonderful improvements which have spread themselves over our whole country. Who can predict the results, even in a few years, of that spirit of enterprise which pervades the Union, when, aided by the Genius of Invention, and propelled onward by powers which she alone can bring into exercise? The very ele-

ments are submissive to her will, and all the endless combinations of mechanism are subservient to her purposes. She participates in almost every business and employment of man. Agriculture itself might as well dispense with fertility of soil, as with her aid in its cultivation.

The greatly increasing number of patents granted, affords some indication of the improvements which have been going on in the useful arts from year to year. The average number issued annually, from 1790 to 1800, was but 26; from 1800 to 1810, the average number was 91; from 1810 to 1820, it was 200; and, for the last ten years, the average number has been 535. During the last year, there were issued 776; and there have been granted in the first quarter of the present year 274, being more in three months than were issued in the whole of the first period of ten years. In the 22 years preceding the war of 1812, the average annual number was 73. The first quarter of the present year indicates an aggregate for the year, of 1,096; the amount of the duties on which, will be upwards of $32,000. The whole number issued at the Patent Office, under the laws of the United States, up to the 31st of March last, is 9,731. This is more than double the number which have been issued either in England or France, during the same period. In England for ten years preceding 1830, the average number of patents granted in one year was 145.

Whoever imagines that, because so many inventions and so many improvements in machinery have been made, there remains little else to be discovered, has but a feeble conception of the infinitude and vastness of mechanical powers, or of the unlimited reach of science.—Much as has been discovered, infinitely more remains unrevealed. The ingenuity of man is exploring a region without limits, and delving in a mine whose treasures are exhaustless. "Neither are all the mysteries of nature unfolded, nor the mind tired in the pursuit of them."

The first conceptions of ingenuity, like the first suggestions of science, are theories which require something of experiment and practical exemplification to perfect. Mechanical inventions are at first necessarily crude and incomplete.—Time is required to develope their imperfections and to make the improvements necessary to their adaption to practical uses. Inventors generally obtain patents before they venture upon those experiments which only can test their inventions. They are apprehensive of being forestalled in their discoveries, and see no other means of protecting themselves against piracy and fraud, than by securing patents at once.

A remedy for this may be easily had in a provision authorizing caveats to be filed in the office, giving security to the right of discovery for a time sufficient for making the necessary experiments, inquiries and improvements.

Heretofore aliens not resident in this country, have not been admitted to the privileges of our patent laws. But, as American citizens are allowed to take out patents in England and in other countries, a principle of reciprocity would seem to require that foreigners should have similar privileges here, on paying a similar duty or amount of fees that is exacted of our citizens abroad. The fees payable in England, on taking out a patent, amount to $585. If a patent be taken out for the three kingdoms of England, Ireland, and Scotland, they amount to $1,680.—In France they are $309; in Spain $292; Austria, $208.

A power in the Commissioner of the Patent Office to reject applications for want of novelty in the invention, it is believed, will have a most beneficial and salutary effect in relieving meritorious inventors, and the community generally, from the serious evils growing out of the granting of patents for every thing indiscriminately, creating interfering claims, encouraging fraudulent speculators in patent rights, deluging the country with worthless monopolies, and laying the foundation for endless litigation.

In nineteen cases out of twenty, probably, the opinion of the Commissioner, accompanied by the information on which his decision is founded, will be acquiesced in. When unsatisfactory, the rights of the applicant will find ample protection in an appeal to a board of examiners, selected for their particular knowledge of the subject-matter of the invention in each case.

By this means, without danger to actual and honest inventors, the number of patents would be somewhat diminished. But there would be more confidence in those which should be granted, and as those which have been heretofore issued, should be daily expiring by their limitation, the community would begin to feel and realize the advantages of such a change. The present law waits till infringements and frauds are consummated—nay, it even aids them; and then it offers an inadequate remedy for the injury, by giving an action for damages. It ought, rather, by refusing to grant interfering patents, to render prosecutions unnecessary. Instead of sanctioning the wrong by granting the privilege to commit it, it should arrest injury and injustice at the threshold, and put an end to litigation before it begins.

Important and interesting as the Patent Office is now considered, it is believed that, under such new organization as is contemplated by the bill presented herewith, it will contribute largely to the great interests of the country, and bear no small part in elevating our national character. American ingenuity has obtained much consideration on the other side of the Atlantic. Even the manufactures of England are not a little indebted to it for some of their most valuable improvements. Her woollen manufactures, especially, have, within a few years, undergone an entire change, by the adoption of American inventions, by which wool has been made as yielding and submissive to the power of machinery as any material whatever. Cotton machinery has also been greatly improved in the hands of our mechanics; and while England receives from us three-fourths of the cotton she uses in raw material, we furnish her also with some of the most valuable improvements in the means of manufacturing it. Indeed, what mechanism or manufacture has, for the last twenty years, been brought across the Atlantic, that has not, on being returned, borne the distinguished marks of the superior ingenuity of American mechanists? Formerly, we borrowed and copied much that was valuable from Europe. Now, Europe is borrowing and copying, with no little advantage, from us; and she must not be too much surprised if she shall soon find a formidable balance against her.

To carry fully into effect the objects which have been had in view, it will be necessary to provide larger and more commodious rooms for models, &c., than those now occupied for that purpose.—They are insufficient for the models of machinery and other inventions now deposited there, and the number will be increasing several hundred, perhaps a thousand, every year. A great number, supposed to be about five hundred, from a want of room for them elsewhere, have been stowed away in a dark garret.—Those which occupy the rooms designed for them, are crowded together in a manner unfavorable for exhibition or examination. In such a situation, it is impossible to give them any systematic or scientific arrangement. This disorder and confusion must necessarily be increased by the addition of those hereafter furnished, or they must be consigned to the garret, the common receptacle, where, instead of promoting a taste for, and facilitating the study of, the useful arts, they will only afford evidence of the improvidence of the Government. In addition to this, the present building is too much exposed to destruction by fire. The loss of records and drawings and of the several thousands of interesting and valuable models now preserved there, would be, in a great degree, irreparable. There is no additional room to be had in the building they now occupy. The Post Office Department, in the same building, instead of having any room to spare which is now appropriated to it, requires a considerable extension of accommodations, from its increased and increasing business. It needs the whole building. The only way, therefore, of providing the necessary extension of room for the accommodation of the Post Office Department, and the city post office, and of providing the requisite accommodation for the Patent Office, is to erect a suitable fire-proof building for the latter on some one of the public lots. There are ample funds arising from duties on patents, heretofore paid into the Treasury, to the account of clerk hire in that office, which remain unexpended. A portion of that surplus fund, being now about $152,000, may well be appropriated to the construction of a building which should be commodious and comparatively safe from fire.

Such a building as this branch of the public interests requires, would do honor to the Government and the country. The Patent Office, with such accommodations, containing the records of this age of inventions, displaying in its halls and galleries numberless models of igenious and useful mechanism, and contrivances in almost infinite variety, adapted to the mechanic arts, to manufactures, to husbandry, to navigation, steam power, horse power, water power, Railroad transportation, and, in fine, to all the common trades and mechanical pursuits of life, as well as to our rapidly multiplying and magnificent public works, would present an object of interest, and tend not a little to elevate our national character. It has been justly remarked that we can go into no mechanic shop, into no manufactory of any description, upon no farm or plantation, or travel a mile on our Railroads or in our steamboats, without seeing the evidence of our originality, and witnessing the fruits and effects of our ingenuity and enterprise. All the inventions and improvements in mechanism which have done so much towards advancing the useful arts and manufactures, should, as far as practicable, be exhibited in one view in the halls of the Patent Office.—Such a display would attract the attention of the many thousands who annually visit the capital of the Union from all quarters of the country, and all parts of the world. No other nation has yet any thing to be compared with it; neither England nor France has ever required models to be deposited of patented machinery. Collection of models and drawings have sometimes been made by private associations, but they are small in number compared with those we possess.

In addition to the models of machinery, it is proposed to embrace an exhibition of specimens of useful and elegant fabrics and of works of art, which manufacturers and artificers may place there for that purpose. It might, too, embrace a cabinet of interesting minerals, which may be received from time to time from the various parts of our widely-extended country, with polished specimens of its beautiful marbles from their different locations, illustrating the geology and many of the natural resources of the country; and, also, a collection of Indian curiosities and antiquities, many of which are now in the possession of one of the Departments, boxed up for want of some suitable place for their exhibition.

In short, the halls of the Patent Office should present a national museum of the arts, and be a general repository of all the inventions and improvements in machinery and manufactures, of which our country can claim the honor; together with such other objects of interest as might conveniently and properly be placed under the superintendence of the Commissioner. Such an institution, while it would be an object of just pride to every American, would have scarcely less influence in advancing and accelerating the progress of the useful arts and the improvement of our manufactures, than would even the encouragement afforded by granting patents for inventions or establishing high tariffs of protection.

With these views, the committee cannot hesitate to recommend an entire reorganization of the Patent Office, and several material alterations in our law of patents, suiting it to the present condition of the arts and the altered circumstances of the country.

A bill in conformity with our views is herewith submitted.

A BILL TO PROMOTE THE PROGRESS OF THE USEFUL ARTS, AND TO REPEAL ALL ACTS AND PARTS OF ACTS HERETOFORE MADE FOR THAT PURPOSE.

Be *it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled*, That there shall be established, and attached to the department of State, an office to be denominated the Patent Office; the chief officer of which shall be called the Commissioner of Patents, to be appointed by the President, by and with the advice and consent of the Senate, whose duty it shall be under the direction of the head of the department, to superintend, execute, and perform, all such acts and things touching and respecting the granting and issuing of patents for new and useful discoveries, inventions, and improvements as are herein provided for, or shall hereafter be, by law, directed to be done and performed, and shall have the charge and custody of all the books, records, papers, models, machines, and all other things belonging to said office. And said Commissioner shall receive the same compensation as is allowed by law to the Commisioner of the Indian Department.

SEC. 2. *And be it further enacted*, That there shall be, in said office, an inferior officer, to be appointed by the said principal officer, with the approval of the Secretary of State, and to be called the Chief Clerk of the Patent Office; who, in all cases during the necessary absence of the Commissioner, or when the said principal office shall become vacant, shall have the charge and custody of the seal, and of the records, books, papers, machines, models, and all other things belonging to the said office. And the said Commissioner may also, with like approval, appoint two other clerks, an examiner of patents, a draughtsman, a mechanist, and a messenger. The said chief clerk shall receive the annual salary of seventeen hundred dollars; two other clerks, twelve hundred and fifty dollars each; examiner, fifteen hundred dollars; draughtsman, twelve mechanist, one thousand dollars; and the messenger five hundred dollars.

SEC. 3. *And be it farther enacted*, That the said principal officer, and every other person to be appointed in the said office, shall, before he enters upon the duties of his office, or appointment, make oath or affirmation truly and faithfully to execute the trust committed to him. And the said Commisioner, and the chief clerk shall also, before entering upon their duties, severally give bonds with sureties, to the Treasurer of the United States, each in the sum of ——— dollars, with condition to render a true and faithful account to him, or his successor in office, quarterly, of all moneys which shall be by them respectively received for duties on patents, and for copies of records and drawings, and all other moneys received by virtue of such office.

SEC. 4. *And be it further enacted*, That the said Commissioner shall cause a seal of office to be made and provided for the said office, with such device as the President of the United States shall approve; and copies of any records, books, papers, or drawings, belonging to said office, under the signature of the said Commissioner, or when the office shall be vacant, under the signature of the chief clerk, with the said seal affixed, shall be competent evidence in all cases in which the original records, books, papers, or drawings, would be evidence. And any person making application therefor, may have certified copies of the records, drawings, and other papers deposited in said office, on paying, for the written copies, the sum of ten cents for every page of one hundred words; and for copies of drawings, the reasonable expense of making the same.

SEC. 5. *And be it further enacted*, That all patents issuing from said office, shall be issued in the name of the United States, and under the seal of said office, and be signed by the Secretary of State, and countersigned by the Commissioner of said office, and shall be recorded, together with the descriptions, specification, and drawings, in the said office, in books to be kept for that purpose. Every such patent shall contain a short description of the invention or discovery, and in its terms grant to the applicant or applicants, his or their heirs, administrators, executors, or assigns, for a term not exceeding fourteen years, the full and exclusive right and liberty of using, and vending to others to be used, the said invention or dicsovery, referring to the specifications for particulars thereof, a copy of which shall be annexed to the patent, specifying what the patentee claims as his invention or discovery.

SEC. 6. *And be it further enacted*, That any person or persons having discovered or invented any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement on any art, machine, manufacture, or composition of matter, not known or used by others before his or their discovery or invention thereof, and not, at the time of his application for a patent, in public use or on sale, with his consent or allowance as the inventor or discoverer; and shall desire to obtain an exclusive property therein, may make application in writing to the Commissioner of Patents, expressing such desire, and the Commissioner, on due proceedings had, may grant a patent therefor. But before any inventor shall receive a patent for any such new invention or discovery, he shall deliver a writen description of his invention or discovery, and of the manner and process of making, constructing, using, and compounding the same, in such full, clear, and exact terms, avoiding unnecessary prolixity, as to enable any person skilled in the art or science to which it appertains, or with which

it is most nearly connected, to make, construct, compound, and use the same; and in case of any machine, he shall fully explain the priciple, and the several modes in which he has contemplated the application of that principle, or character by which it may be distinguished from other inventions; and shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery. He shall, furthermore, accompany the whole with a drawing, or drawings, and written references, where the nature of the case admits of drawings, or with specimens of ingredients, and of the composition of matter, sufficient in quantity for the purpose of experiment, where the invention or discovery is of a composition of matter; which descriptions and drawings, signed by the inventor, and tested by 2 witnesses shall be filed in the patent office; and he shall, moreover, furnish a model of his machine, in all cases which admit of a representation by model, of a convenient size to exhibit advantageously its several parts. The applicant shall also make oath or affirmation that he does verily believe that he is the original inventor or discoverer of the art, machine, composition, or improvement, for which he solicits a patent, and that he does not know or believe that the same was ever before known or used; which oath or affirmation may be made before any person authorized by law to administer oaths.

Sec. 7. *And be it further enacted*, That, on the filing of any such application, description, and specification, and the payment of the duty hereinafter provided, the Commissioner shall make, or cause to be made, an examination of the alleged new invention or discovery; and if, on any such examination, it shall not appear to the Commissioner that the same had been known and used prior to such alledged discovery thereof by the applicant, or had been in public use, or on sale, with his consent or allowance prior to the application, if he shall deem it to be sufficiently useful and important, it shall be his duty to issue a patent therefor. But whenever, on such examation, it shall appear to the Commissioner that the applicant was not the original inventor or discoverer thereof, or that any part of that which is cclaimed as new had before been known and used as aforesaid, or that the description is defective and insufficient, he shall notify the applicant thereof, giving him, briefly, such information as may be useful in judging of the propriety of renewing his application, or of altering his specification to embrace only that part of the invention or discovery which is new. In every such case, if the applicant shall elect to withdraw his application, he shall be entitled to receive back—— dollars, part of the duty required by this act, on filing a notice in writing of such election in the Patent Office, a copy of which, certified by the Commissoner, shall be a sufficient warrant to the Treasurer for paying back to the applicant the said sum of ——— dollars. But if the applicant in such case shall persist in his claim for a patent, with or without any alteration of his specification, he shall be required to make oath or affirmation anew, in manner as aforesaid. And if the specification and claim shall not have been so modified as, in the opinion of the Commissioner, shall entitle the applicant to a patent, he may, on appeal, and upon request in writing, have the decision of a board of examiners, to be composed of three disinterested persons, who shall be appointed for that purpose by the Secretary of State, and to be selected for their knowledge and skill in the particular art, manufacture, or branch of science to which the alleged invention appertains; who shall be furnished with a certificate in wri ing, of the opinion and decision of the Commissioner, stating the particular grounds of his objection, and the part or parts of the invention which he considers as not entitled to be patented. And the said board shall give reasonable notice to the applicant, as well as to the Commissioner, of the time and place of their meeting, they may have an opportunity of furnishing them with such facts and evidence as they may deem necessary to a just decision; and it shall be the duty of the Commissioner to furnish the board of examiners with such information as he may possess relative to the matter under their consideration. And on an examination and consideration of the matter by such board, it shall be in their power, or of a majority of them, to reverse the decision of the Commissioner, either in whole or in part; and their opinion being certified to the Commissioner, he shall be governed thereby, in the further proceedings to be had on such application; *Provided, however*, That before a board shall be instituted in any such case, the applicant shall pay to the Commissioner the sum of ——— dollars, which shall be in full compensation to the persons who may be so appointed, for their examination and certificate as aforesaid.

Sec. 8. *And be it further enacted*, That whenever an application shall be made for a patent, which, in the opinion of the Commissioner, would interfere with any other patent for which an application may be pending, or with any unexpired patent which shall have been granted, it shall be the duty of the Commissioner to give notice thereof to such applicants, or patentees, as the case may be; and if either shall be dissatisfied with the decision of the Commissioner on the question of priority or right of invention, he may appeal from such decision, on the like terms and conditions as are provided in the preceding section of this act: and the like proceedings shall be had to determine which, or whether either of the applicants is entitled to receive a patent as prayed for.

Sec. 9. *And be it further enacted*, That before any application for a patent shall be considered by the Commissioner as aforesaid, the applicant shall pay into the Treasury of the United States, or into the Patent Office, or into any of the deposite banks, to the credit of the Treasury, if he be a citizen of the United States, or an alien and shall have been resident in the United States for one year next preceding, and shall have made oath of his intention to become a citizen thereof, the sum of forty dollars; if a subject of the King of Great Britain, the sum of five hundred dollars; and all other persons the sum of three hundred dollars; for which payment duplicate receipts shall be taken, one of which to be filed in the office of the Treasurer. And the moneys received into the Treasury under this act shall constitute a fund for the payment of the salaries of the officers and clerks, herein provided for, and all other expenses of the Patent Office, and to be called the patent fund.

Sec. 10. *And be it further enacted*, That where any person hath made, or shall have made, any new invention, discovery, or improvement, on account of which a patent might by virtue of this act be granted, and such person shall die before any patent shall be granted therefor, the right of applying for and obtaining such patent shall devolve on the executor or administrator of such person, in trust for the heirs at law of the deceased, in case he shall have died intestate; but if otherwise, then in trust for his devisees, in as full and ample manner, and under the same conditions, limitations, and restrictions, as the same was held, or might have been claimed or enjoyed by such person in his or her lifetime; and when application for a patent shall be made by such legal representatives, the oath or affirmation provided in the third section of the beforementioned act, shall be so varied as to be applicable to them.

Sec. 11. *And be it further enacted*, That every patent issued in pursuance of this act shall be assignable in law, either as to the whole interest, or any undivided part thereof, by any instrument in writing; which assignment shall be recorded in the Patent Office within three months from the execution thereof, for which the assignee shall pay the Commissioner the sum of ——— dollars.

Sec. 12. *And be it further enacted*, That any citizen of the United States, or alien, who shall have been resident in the United States one year next preceding, and shall have made oath of his intention to become a caveat setting forth the design and purpose thereof, and its principal and distinguishing characteristics, and praying protection of his right, till he shall have matured his invention; which caveat shall be filed in the confidential archives of the office, and preserved in secrecy. And if application shall be made by any other person within one year from the time of filing of such caveat, for a patent of any invention with which it may in any respect interfere, it shall be the duty of the Commissioner to give notice to the person filing the caveat, of such application and of such supposed interference, who shall, within two months after receiving the notice, if he would avail himself of the benefit of his caveat, file his description, spifications, drawings, and model; and if, in the opinion of the Commissioner, the specifications of claim interfere with each other, like proceedings may be had in all respects, as are in this act provided in the case of interfering applications: *Provided, however*, That no opinion or decision of any board of examiners, under the provisions of this act, shall preclude any person interested in favor of or against the validity of any patent which has been or may hereafter be granted, from

a citizen thereof, who shall have invented any new art, machine, or improvement thereof, and shall desire further time to mature the same, may file in the Patent Office the right to contest the same in any judicial court, having jurisdiction of the subject-matter.

SEC. 13. *And be it further enacted*, That whenever any patent which has heretofore been granted, or which shall hereafter be granted, shall be inoperative or invalid, by reason of a defective or insufficient description or specification, or by reason of the patententee claiming in his specification as his own invention, more than he had or shall have a right to claim as new; if the error has, or shall have arisen by inadvertency, accident or mistake, and without any fraudulent or deceptive intention, it shall be lawful for the Commissioner, upon the surrender to him of such patent, and the payment of a further duty of fifteen dollars, to cause a new patent to be issued to the said inventor, for the same invention, for the residue of the period then unexpired for which the original patent was granted, in accordance with the patentee's corrected decription and speeification. And in case of his death, or any assignment made by him of the original patent, a similar right shall vest in his executors, administrators, or assignees. And the patent, so re-issued, together with the corrected description and specification, shall have the same effect and operation in law, on the trial of all actions relative to the violation of such invention, as though the same had been originally filed in such corrected form, before the serving out of the original patent. And whenever the original patentee shall be desirous of adding the description and specification of any new improvement of the original invention or discovery which shall have been invented or discovered by him subsequent to the date of his patent, he may, like proceedings being had in all respects, as in the case of original applications, and on the payment of fifteen dollars, as hereinbefore provided, have the same annexed to the original description and specification; and the Commissioner shall certify, on the margin of such annexed description and specification, the time of its being annexed and recorded; and the same shall thereafter stand on the same footing to all intents and purposes as though it had been embraced in the original description and specification.

SEC. 14. *And be it further enacted*, That whenever in any action for damages for using or selling the thing whereof the exclusive right is secured by any patent heretofore granted, or by any patent which may hereafter be granted, a verdict shall be rendered for the plaintiff in such action, it shall be in the power of the court to render judgment for any sum above the amount found by such verdict as the actual damages sustained by the plaintiff, not exceeding three times the amount thereof, according to the circumstances of the case; and such damages may be recovered by action on the case, in any court of competent jurisdiction.

SEC. 15. *And be it further enacted*, That the defendant in any such action shall be permitted to plead the general issue, and to give this act and any special matter in evidence of which notice in writing may have been given to the plaintiff or his attorney, thirty days before trial, tending to prove that the description and specification filed by the plaintiff does not contain the whole truth relative to his invention, or discovery, or that it contains more than is necessary to produce the described effect; which conceal ment or addition shall fully appear to have been made for the purpose of deceiving the public; or that the thing patented was not originally discovered by the patentee, or had been in use, or had been described in some public work anterior to the supposed discovery thereof by the patentee, or had been in public use or sold with the consent and allowance of the patentee before his application for a patent; or that he had surrepticiously or unjustly obtained a patent for that which was in fact invented or discovered by another; or that the patentee if an alien at the time the patent was granted, had failed and neglected, for the space of eighteen months from the date of the patent, to put in operation and use in the United States, and put on sale to the citizens thereof, on reasonable terms, the invention or discovery for which the patent issued; or in case the same, for any period of eighteen months after it shall have been put in operation and use, shall cease to be so used or put on sale; in either of which cases judgment shall be rendered for the defendant with costs; *Provided, however*, That whenever the plaintiff shall fail to sustain his action on the ground that, in his specification of claim is embraced more than that of which he was the first inventor, if it shall appear that the defendant had used or violated any part of the invention justly and truly specified and claimed as new; it shall be in the power of the court to adjudge and award as to costs as may appear to be just and equitable.

SEC. 16. *And be it further enacted*, That whenever there shall be two interfering patents, or whenever a patent on application shall have been refused on an adverse decision of a board of examiners on the ground that the patent applied for would interfere with an unexpired patent, previously granted any person interested in any such patent, either by assignment or otherwise, in the one case, and any such applicant in the other case, may have remedy by bill in equity; and the court having cognizance thereof, on notice to adverse parties and other due proceedings had, may adjudge and declare either of the patents void in the whole or in part, and may also adjudge that such applicant is entitled, according to the principles and provisions of this act, to have and receive a patent for his invention as specified in his claim, or for any part thereof, as the fact or priority of right or invention shall in any such case be made to appear. And such adjudication, if it be in favor of the right of such applicant, shall authorize the Commissioner to issue such patent, on his filing a copy of the adjudication and otherwise complying with the requisitons of this act. *Provided, however*, that no such judgement or adjudication shall effect the rights of any person except the parties to the action and those deriving title from or under them subsequent to the rendition of such judgment.

SEC. 17. *And be it further enacted*, That all actions, suits, controversies, and cases arising under any law of the United States granting or confirming to inventors the exclusive right to their inventions or discoveries, shall be originally cognizable, as well in equity as at law, by the circuit courts of the United States, or any district court having the powers and jurisdiction of a circuit court, which courts shall have power, upon bill in equity filed by any party agrieved in any such case, to grant injunctions according to the course and principles of courts of equity, to prevent the violation of the rights of any inventor as secured to him by any law of the United States, on such terms and conditions as said courts may deem reasonable; *Provided, however*, That from all judgments and decrees of any such court rendered in the premises, a writ of error or appeal, as the case may require, shall lie to the Supreme Court of the United States, in the same manner and under the same circumstances, as is now provided by law in other judgments and decrees of circuit courts. and in all other cases in which the court shall deem it reasonable to allow the same.

SEC. 18. *And be it further enacted*, That there shall be provided for the use of said office, a library of scientific works and periodical publications, both foreign and American, calculated to aid and facilitate the discharge of the duties hereby required of the chief officers therein, to be purchased under the direction of the Committee of the Library of Congress. And the sum of ——dollars annually is hereby appropriated for that purpose, to be paid out of the patent fund.

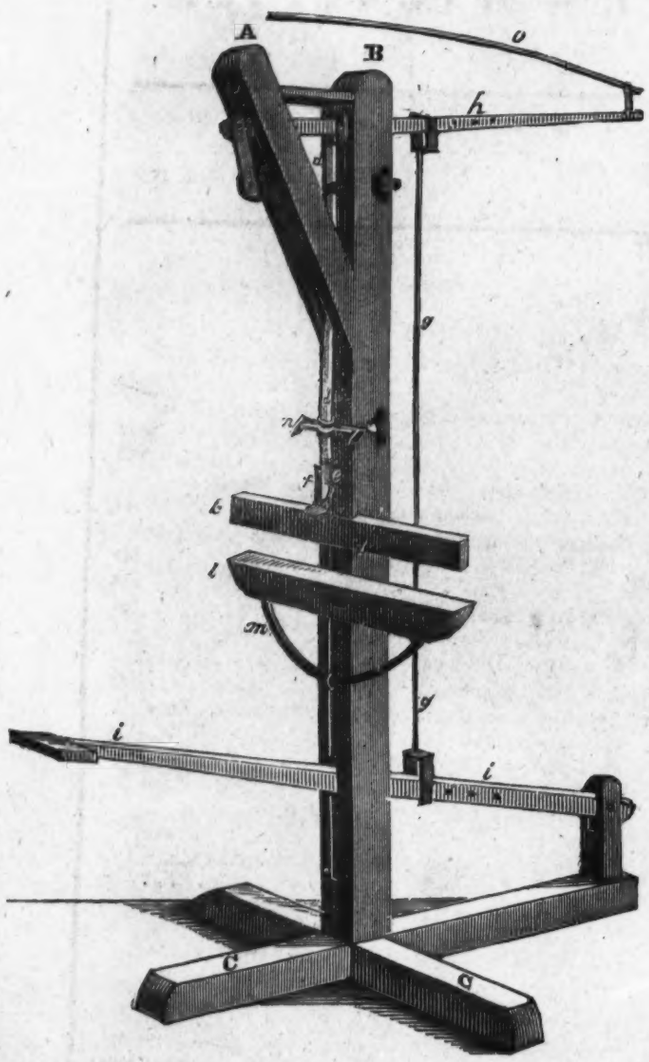
SEC. 19. *And be it further enacted*, That it shall be the duty of the Commissioner to cause to be classified and arranged, in such rooms or gallaries as may be provided for that purpose, in suitable cases, when necessary for their preservation, and in such manner as shall be conducive to a benficial and favorable display thereof, the models and specimens of compositions and of fabrics and other manufactures and works of art, patented or unpatented, which have been or shall hereafter be deposited in said office. And said rooms or galleries shall be kept open during suitable hours for public inspection.

SEC. 20. *And be it further enacted*, That all acts and parts of acts heretofore passed on this subject be, and the same are hereby, repealed: *Provided, however*, That all actions and processes in law or equity sued out prior to the passage of this act, may be prosecuted to final judgment and execution, in the same manner as though this act had not been passed, excepting and saving the application to any such action, of the provisions of the fourteenth and fifteenth sections of this act, so far as they may be applicable thereto.

WILLIAM ATKINSON, Rochester, New York Real Estate Broker, buys and sells on commission, FARMS in the County of Monroe, and attends to the Collection of Mortgages.

Persons desirous of purchasing Farms in that fertile region, will do well to call on him. 6t*

PAIGE'S MORTICING MACHINE.



MORTICING MACHINE.—The following cut represents a Morticing Machine, exhibited at the Fair of the AMERICAN INSTITUTE, in October last, by Mr. George Page, of Keene, New-Hnmpshire, to which was awarded a *silver medal*. This simple and unpretending machine was viewed, and its operations witnessed, by a large number of practical mechanics, who were highly gratified by the rapidity and precision of its movements, and the wonderful accuracy of its work. Any person could, at once, perceive that, with ordinary care, and a high prices of labor. A small proportion, great advantage and convenience in forwarding work during the present scarcity and few hours' experience, any man can perform as much labor in *one day*, with this machine, as in a *whole week* in the ordinary mode. Such, indeed, is the simplicity of its operation, and economy of its use, that over three hundred machines have been sold since the Fair in October last; and it is probably not too much to say, that the owners of them have, on an *average*, saved *twice the cost of them*, in addition to the however, of those mechanics who have morticing to do, have yet obtained them. A small number only of those journeymen who "work by the piece," have yet consulted their own interest by adopting them. A few, however, who view things properly, have got them, and are, consequently, enabled to do much more work, and, of course, to earn more money, than was possible before. If a man, who worked on bedsteads, for instance, which have much morticing, could formerly earn $15 a week, he can now do the same morticing in one-sixth or one-eighth of the time, and, of course, do more work, and certainly do it better. Indeed, any man who has much morticing to do, will save the cost of a machine in a month, and even less.

This machine may also be used, with a little alteration, for morticing *hubs*, for carriages, waggons. &c.; and an experienced hand can prepare and mortice a sett of common-sized carriage hubs in *half an hour*, with ease, and do them far more *accurately* than in the ordinary way.

The HUB MACHINE can be attached to the morticing machine, and the whole will not occupy, when in use, a space of over four feet by four in the shop, for the workman and his materials.

We are *un*-authorised, yet take the liberty of referring to the following gentlemen, who have machines in use, and who will probably give an opinion in relation to them:—

Talbot & Perry,	Prince st.,	used for	mahogany doors.
James De Witt,	James st.,	do	do
Charles Baker,	Grand st.,	do	do
Lasher,		do	do
J. Green,	Orange st.,	do	chairs.
James Berry,	Le Roy st.,	do	do
Hadden & Gedney,	Prince st.,	do	carpenters' work.
George Smith,	Prince st.,		
George Webb,	Greene st.,	do	do
J. L. Black,	Amos st.,		

Andrew Woodruff, Jefferson, corner of Henry st.

An hundred others who have used them might also be named if it were necessary, but it is not, as all the descriptions and opinions in the world will not be as satisfactory to many as one half hour's observation of its operation; we therefore refer those who may desire to examine it, to the office of the manufacturer, No. 136 Nassau, corner Beekman street, or to the shops of the gentlemen whose names are given above for further evidence, if they desire it.